



AGRICULTURAL RESEARCH INSTITUTE
PUSA

THE
ENTOMOLOGIST

An Illustrated Journal

OF

GENERAL ENTOMOLOGY

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S.

W. LUCAS DISTANT, F.E.S., &c.

F. W. FROHAWK, F.E.S., M.B.O.U.

C. J. GAHAN, M.A., F.E.S.

W. J. LUCAS, B.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

DR. D. SHARP, F.R.S., F.E.S., &c.

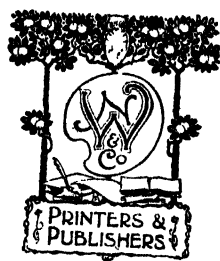
"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

VOLUME THE FORTY-FIFTH.

LONDON:

WEST, NEWMAN & CO., 54, HATTON GARDEN.
SIMPSON, MARSHALL, HAMILTON, KENT & CO., LIMITED.

—
1912.



LIST OF CONTRIBUTORS.

- ABBOT, E. P., 183
 ADAMS, CYRIL, 278
 ADKIN, B. W., F.E.S., 299
 ADKIN, R., F.E.S., 79, 81
 AIKEN, The Rev. JAMES, M.A., 146
 ANDERSON, JOSEPH, 208, 209, 327
 BARCLAY, F. H., F.E.S., 209
 BARRACLOUGH, W., 209
 BARBAUD, P. J., F.E.S., 48
 BARRETT, J. PLATT, F.E.S., 232, 283, 306
 BAUMANN, R. T., 157
 BLAIR, R. G., F.E.S., 207
 BLENKARN, S.A., F.E.S., 101, 182, 184,
 209, 299
 BOWATER, W., 137
 BOYD, A. W., M.A. F.E.S., 47, 212, 234,
 284
 BRAITHWAITE, J. O., 205
 BURR, MALCOLM, D.Sc., M.A., F.E.S., 236
 BURT, L. T., 182
 BUTLER, DOUGLAS H., 327
 BUTLER, W. E., F.E.S., 80, 328, 343
 CAMERON, P., 195
 CAMPION, F. W. & H., 173, 321
 CAMPION, HERBERT, 117, 151, 185, 235,
 327, 328
 CARTER, J. S., 300
 CHAPMAN, T. A., M.D., F.E.S., 181, 182
 CLAYTON, Rev. W., 181, 208, 301
 CLUTTEN, W. G., 30, 158
 CLUTTERBUCK, C. GRANVILLE, F.E.S., 39,
 101, 343, 344
 COCKERELL, Prof. T. D. A., 9, 119, 175,
 322
 CORBIN, G. B., 278
 CROFT, E. OCTAVIUS, M.D., F.E.S., 36
 DAVID, G. U., 231
 DEWAR, D., 326
 DISTANT, W. L., F.E.S., 200, 251
 DOIDGE, H., 231, 300
 DOLTON, H. L., 29, 157
 DONISTHORPE HORACE ST. JOHN K.,
 F.Z.S., F.E.S., 100
 DRUCE, HAMILTON, H., F.Z.S., F.E.S., 182
 DUNSTER, L. E., 100, 230
 EDELSTEN, H. M., F.E.S., 285
 EDWARDS, F. W., B.A., F.E.S., 191, 217
 260, 277, 298
 ENOCK, G. J., 100
 FLEET, H., 280, 299
 FROHAWK, F. W., M.B.O.U., F.E.S., 225,
 237, 253, 298
 GAHAN, C. J., M.A., F.E.S., 49, 107, 206
 GOODWIN, EDWARD, F.E.S., 79, 326
 GURNEY, GERARD H., F.E.S., 96, 133,
 158, 278
 HAINES, F. H., D.P.H. (Lond.), &c., 201
 HARRISON, J. W. H., B.Sc., 315
 HARWOOD, BERNARD SMITH, 208
 HODGE, A. E., 80
 HOLFORD, H. O., F.E.S., 157
 HOOLE, The Rev. ARTHUR, 279
 JACKSON, F. SEYMOUR, 209
 JOICEY, J. J., F.E.S., 229, 231, 342
 JUPP, B. E., 181, 182, 183
 KAYE, W. J., F.E.S., 150, 156
 KERSHAW, G. B., F.E.S., 31, 229, 256
 LE RAY, G., 299
 LITTLEWOOD, F., 35, 138, 156, 161, 186,
 211, 277, 281
 LOFTHOUSE, T. ASHTON, F.E.S., 29
 LOWE, The Rev. F. E., M.A., F.E.S., 144
 LUCAS, W. J., B.A., F.E.S., 48, 99, 106,
 114, 141, 164, 171, 182, 184, 221, 224,
 227, 234, 350
 LYLE, G. T., 126, 138
 MASON, G. W., 30, 326
 MANDERS, Lt.-Colonel N., F.Z.S., F.E.S.,
 30
 MANLEY, Capt. W. G., 79, 80
 MANSBRIDGE, W., F.E.S., 45, 84, 94, 139,
 233, 350
 MATHEW, G. F., Paymaster-in-Chief,
 R. N., F.E.S., 34, 135, 137, 153, 178,
 202, 227, 264, 278, 296, 301, 343
 MELDOLA, Prof. R. D.Sc., LL.D., F.R.S.,
 &c., 8, 156, 184
 MELLOWS, CHARLES, 30, 344
 METCALFE, The Rev. F.E.S., 279
 MEYRICK, EDWARD, B.A., F.R.S., F.E.S.,
 &c., 89, 205
 MORLEY, CLAUDE, F.E.S., F.Z.S., 4, 29,
 76, 79, 99, 153, 155, 275, 341, 342
 MORRIS, A. C., 137, 230
 MORTON, KENNETH J., F.E.S., 109
 MOULTON, J. C., B.Sc., F.L.S., F.E.S.,
 &c., 213, 246
 MUIRHEAD, J. M., 100
 NEVINSON, E. B., F.E.S., 79
 NICHOLSON, C., 158, 206
 NOAKES, A., F.E.S., 229
 NOBBS, G., 29, 278
 NURSE, Lt.-Colonel C. G., F.E.S., 93
 OLIVER, G. B., 208
 PIZZA, E., 184
 PLUM, H. V., 182
 PORRITT, GEO. T., F.L.S., F.E.S., 205
 POSTANS, A. T., 230, 325

- PROUT, L. B., F.E.S., 1, 3, 181, 196, 241
 RATTRAY, Colonel R. H., 80
 RAVEN, The Rev. C. E., 208
 REID, PERCY C., 184, 206
 RILEY, NORMAN D., F.E.S., 212, 308
 ROBINSON, L. H. MOSSE, 33, 182
 ROBINSON, L. W., 182
 ROTHSCHILD, The Hon. N. CHARLES,
 M.A., F.L.S., F.E.S., &c., 237, 279
 ROUTLEDGE, G. B., F.E.S., 48
 ROWLAND-BROWN, H., M.A., F.E.S., 5,
 14, 56, 78, 84, 137, 207, 268, 287, 307,
 324, 333
 SAVILLE, W., 181
 SHARP, DAVID, M.A., M.B., F.R.S.,
 F.E.S., &c., 289
 SHAW, V. E., 106
 SHELTON, W. G., F.E.S., 23, 65, 100,
 122, 309, 337
 SLADEN, The Rev. C. A., 343
 SMITH, B. HAROLD, B.A., F.E.S., 183,
 209
 SMITH, ROBERT S., 207
 SOPP, E. J. BURGESS, F.E.S., 149
 SOUTH, RICHARD, F.E.S., 1, 62, 73, 108,
 138, 140, 156, 157, 188, 204, 231, 236,
 308, 325, 327, 342, 350, 351, 352
 STENTON, RUPERT, F.E.S., 7
 STIFF, The Rev. ALFRED T., 326
 STONEHAM, Lieut. H. F., F.E.S., 157, 210
 STOWELL, E. A. C., 182, 183
 TATCHELL, LEONARD, 231
 TARBAT, The Rev. J. E., 30, 100
 THEOBALD, F. V., M.A., F.E.S., &c., 20,
 165, 223
 THORNE, G. TALBOT, F.E.S., 325
 THURNALL, A., 327
 TODD, R. G., F.E.S., 285
 TULLOCH, Major B., F.E.S., 17
 TURNER, Hy. J., F.E.S., 45, 104, 139,
 188, 233, 284, 307, 349
 VIGGERS, CHARLES, 209, 332
 VINAI, HUGH J., 300
 WARREN, B. C. S., F.E.S., 138
 WALDEGRAVE, Rt. Hon. Earl, 299
 WHEELER, The Rev. G., M.A., F.E.S.,
 41, 103, 163, 187, 212, 331, 346
 WHITTAKER, OSCAR, 45, 84, 233
 WHITTINGHAM, The Rev. W. G., M.A.,
 F.E.S., 289, 324
 WHITTLE, F. G., 230
 WILEMAN, A. E., F.E.S., 69, 91, 130,
 147, 168, 258
 WILLIAMS, D. S., 181
 WOODBRIDGE, FRANCIS B., F.E.S., 300
 YOUNG, S. L. O., M.D., 230

INDEX.

GENERAL.

- Abnormal Emergence of *Pieris rapæ*, 30
A Book Sale, 80
Abundance of Larvæ of *Abraxas grossulariata*, 205; of *Pyrameis atalanta* larvæ, 299
Acherontia atropos at Bradford, 209; and *Sphinx convolvuli* in Lancashire, 100
A Collecting Trip to the Camargue and the Sierra Albarracin, 109
Adams Collection of Lepidoptera, The, 342
Africa: Rhodesia, 196; Transvaal, 92
Agrotis hypoborea (alpina), &c., in Perthshire, 343; put in May, 208, 230
A Holiday in Norfolk, 287
Anarta myrtillos reared in July from June larvæ, 325
A New Generic Name in the Hemitheinae, 181
A New Species of Phasmidæ of the Genus *Prisopus*, 49
A New Strawberry Aphis, 223
Annosia plexippus, Note on, 146
Aporophila nigra, 138
Apparent Autumnal Migration of *Pyrameis atalanta*, 324
A Public Benefactor, 306
A Rare Jamaica Butterfly, 150
Arctic Dragonflies, 327
Argynnis euphrosyne, ab., 277; *Selene* in August, 80
As Others See us, 287
Attempt to Colonize *Papilio machaon* in Essex, An, 8
Balatella germanica (Orthoptera), 184
Boarmia cinctaria, 157
Borneo: Serambu, Sarawak, 213, 246
Brephos parthenias, ab., 181
British Mosquitos (Culicidæ), Notes on the, 191, 217, 260
British Neuroptera in 1911, 221; Odonata in 1911, 141, 171; Orthoptera in 1911, 114
Butterflies, &c., at Freshwater, 230
Butterflies at Digne, 96, 133
Butterfly Collecting in Sicily and Calabria in 1911, 231, 281, 303
Butterfly Hunt in Some Parts of Unexplored France, 14
Butterfly Notes from Heidelberg, 34
By the Way, 27, 76, 98, 152, 275, 340
Callophrys (Thecla) rubi, early appearance, 156
Calymnia pyralina in West Surrey, 157
Camptogramma fluviata, and *Phryxus livornica* at Lewis, 300
Capture of Moths at Sea, 204
Catocala nupta, ab, 300
Celastrina (Cyaniris) argiolus in April, 157
Cerura bifida in May, 183
Cænonympha typhon, 137
Colias edusa at Reigate, 181; in Bucks, 207; in Dorsetshire, 231; in Glamorganshire, 231; in Isle of Wight, 231; in Kent, 231; in North Devon, 342; in Somerset, 299; in Wiltshire, 278; notes on, 298
Colias edusa, &c., in North Devon, 343
Colias edusa, *Pyrameis cardui*, and *P. atalanta* at Folkestone, 299; in the Isle of Wight, 278; in Wilts, 343
Colias edusa var. *helice* in Channel Isles, 299; in Kent, 299
Colias hyale in Hants, 1911, 79, 80
Collecting in North Devon in 1909-1910, 36; in Westmoreland, 158, 183, 210, 279
Cornwall: Penzance, 30
Corrections, 158, 184, 298
Cucullia umbratica reared in September, 29
Cyaniris argiolus at Reading, 29
Daphnis (Chærocampa) nerii in Kent, 209
Dasyampa rubiginea at Christchurch, 183
Dasypolia templi in Lincolnshire, 326
Depressaria putridella in the Harwich district, 137
Description of a New Ethiopian Cicada, 200; of a New Species of *Anomalon* (Ichneumonidæ) from Hong Kong, 195; of the Egg of *Vanessa polychloros*, 225
Devonshire: North, 36; South, 30
Deilephila galii in Inverness-shire, 278; in Somerset, 231; a correction, 300
Diaphora mendica in Ireland, 209

- Dicycla oo* and *Palimpsestis ocularis* at Winchmore Hill, 230
Dipterygia scabriuscula in Hyde Park, 279
Discomyza cimiciformis, Hal., On the Habits of, 342
 Dorset Odonata in 1911, 201
 Dragonfly Season of 1911, 173
Drymonia chaonia, ab., 181
 Early Appearance of Butterflies in 1912, 208; of Lepidoptera, 100
 Early Emergences, 137, 183, 207
 Early Stages of *Eustroma reticulata*, The, 85; of *Hesperia linea* (= *thau-mas*), 253
 Editorial, 1
 Egg-laying of *Hesperia linea* (*thau-mas*), 253
 Egg of *Eustroma reticulata*, 277
Endromis versicolor in October, 29
Erebia epiphron var. *cassiope*, Fabr., Note on, 333
Erebia manto and its Varieties above Champéry, 144
Erebia melampus, Fuessl., in Central France, 333
 Erratum, 39
 Essex: Dovercourt, 135, 137, 152, 178, 202, 208, 227, 264, 296
Euchloe cardamines in April, 182
Eurois occulta and *Cosmia paleacea* in Yorkshire, 344
Euproctis chrysorrhœa in Norfolk, 230
Eustroma reticulata, Schiff., Variation of, 1
 Feeding Habits of Scorpion-flies, The, 321
 Formalin a Remedy for Mould on Cabinet Specimens, 30
 France: Arles, 109; Camargue, 109; Charente-Inférieure, 14; Digne, 96, 133; Dompierre, 14; Gavarnie, 61; High Pyrenees, 56
 Further Records of *Colias edusa* in Eng-land, 327
 Germany: Heidelberg, 34
 Gloucestershire Lepidoptera, 101, 344
Gynandrous Antheræa mylitta, 46; *Cy-aniris argiolus*, 208; *Euchloe carda-mines*, 181
 Hampshire: Christchurch, 149; New Forest, 126, 158, 301; Porchester, 31
Hesperia melotis, Dup. (*Hypoleucos*, Led.), 77
Hesperia onopordi in the Pyrenees, 137
Idiaspa maritima, Hal. in Suffolk, 155
 Immigration of *Pyrameis atalanta*, 17
 Isle of Wight, Lepidoptera in, 184
 Italy: Calabria, 281, 303
Ithysia, The Genus, 315
 Kent: Aphididæ, 20; Tonbridge dis-trict, 80
Labidura riparia, 99
 Lancashire: Burnley, 80; Grassington, 157
Laphygma exigua in South Wales, 184
 Large "Coppers" in Wicken Fen, 156
 Larva of *Cardiophorus asellus*, The, 189
 Late Emergence of *Apatura iris*, 326
 Lepidoptera and Odonata in South Cornwall, 30
 Lepidoptera at Burnley, 30; at Gras-sington, Notes on, 157; at Light in early May, 183; attracted "by Honey-dew" on Larch-shoots, 229; from the Isle of Wight, Notes on, 184; in the Porchester district of Hants, 31; in the Tonbridge district 1911, 80; of the Norwegian Provinces of Odalen and Finnmark, 309, 337; of the Swedish Provinces of Jemtland and Lapland, 23, 65, 100
Leucania favicolor, Barr., Notes on, 62; unipuncta in Isle of Wight, 326
 Life-histories of *Tapinostola concolor* and *T. helmanni*, 285
 Life-history of *Melanargia japygia* subsp. *suwarovius*, 237
Limenitis sibylla and *Apatura iris* in Surrey, 231
 Lincolnshire: Peterboro', 154
Lithosia lutarella (*pygmeola*) and *Crambus fascelinellus* in Norfolk, 279
Lycæna argiades (Life-history), An Amendment, 298
Lycænopsis (*Cyaniris*) *argiolus*, Linn., in April, 182
 Males of *Bupalus piniaria* attracted by a Spider, 229
Manduca (*Acherontia*) *atropos* in Salop, 182
Metopius dentatus, Fab., and *Sphinctus serotinus*, Grav., 78
 Metrioptera (*Platyceles*) *roeselii*, Notes on British Occurrence, 117; in Essex, 207
 Metrioptera *roeselii* (fig.), 224
Metrocampa margaritaria and *Thyatira batis* in Isle of Skye, 279
Monochamus galloprovincialis, Oliv., at Hackney, 205
 Mortality among *Delphax* (*Aræopus*) *pulchellus*, Curt., 341
 Natural History Books from the Harri-son Library, 204
Nemophila noctuella at Kew, 182
Nemoura dubitans, Morton, as a British Species, 93
 New Aberration of *Zonosoma linearia*, 3
 New and Little-known Bees, 175
 New British Proctotrypidæ, 97
 New Forest Notes, 1911, 126, 158, 801
 New Species of Boarmiinae from For-mosa, 69, 90; of Geometridæ from Formosa, 168; of Lepidoptera from Formosa, 258; of Noctuidæ from For-mosa, 130, 147
 Norway—Finnmark and Odalen, 309, 327

Notes from an Essex Lepidopterist's Diary, 135, 153, 178, 202, 227, 264, 296
 Notes on *Agrotis exclamationis*, &c., 300
 Notes on *Anosia plexippus*, 146
 Notes on "Micro" Lepidoptera in South Devon, 30
 Notes on the Dragonfly Season of 1911, 173
 Notes on the Life-history of *Colias nastes* var. *werdandi*, with Description of Ova and Larvæ, 122
 Notes on *Rhopalosiphum solani*, Kalt., 165
Nyssia hispidaria in Norfolk, 137
 OBITUARY:—
 Capper, S. J., 84, 139
 Cottam, Arthur, 48
 Dixon, Michael C., 48
 Fitch, Edward Arthur, 235
 Jeffrey, William Rickman, 332
 Kirby, William Forsell, 351
 Shelford, Robert, 236
 Smith, Prof. John B., 164
 Occurrence of Second Broods of *Pyrameis atalanta* and *P. cardui*, 324
Odonata in South Cornwall, 30; in the Chichester District, 149
 On the Name *Rhyacionia*, Hb., 89
Oviposition of *Nemobius lucina*, 229; of *Plusia moneta*, 206; of *Tapinostola concolor*, 256
Panorpa cognata in Surrey, 328
Papilio dardanus var. *leighi* and *Danaus chrysippus-dorippus* in Natal, 324
Pe.arge egeria—Early Appearance, 156
Perenophtilota (*Campptogramma*) *fluviala* in Surrey, 230
Phigalia pедaria in December, 100; noted from Reading, 80
Phryxus (*Deilephila*) *livornica*, 278; at Dover, 183; in Cornwall, 209; in Devon, 100; in Norfolk, 209; in North Wales, 209
Phryxus livornica, *Manduca atropos*, and *Heliothis peltigera* in Cornwall, 183
Plusia moneta, Notes on, 181, 206, 207
Polyploca flavicornis in February, 183
 Pupation of Lepidopterous Larvæ in Glass Tubes, 7
Pyrameis atalanta, ab., 326; at Chichester, 208; at Dover, 182; at Haslemere, 182; in Early Spring, 138; in Isle of Wight, 182
Pyrameis cardui at Chichester, 208; at Dover, 182; at Kew, 182; in Isle of Wight, 182; in April, 156; in Norfolk, 182; Notes on, 298, 328
 RECENT LITERATURE:—
 Annals of Tropical Medicine and Parasitology, vol. v., 47
 Memorias do Instituto Oswaldo Cruz, 47

House-flies and their Connection with Disease, 48
 A Manual of Philippino Silk Culture, by C. S. Banks, 48
 Leitz' Catalogue of Prismatic Binoculars, 48
 The Annals of Scottish Natural History, 1911, 106
 Social Life in the Insect World, by J. H. Fabre, 106
Ichneumonologia Britannica. The Ichneumons of Great Britain, vol. iv., by Claude Morley, 107
 Bulletins of the United States Department of Agriculture, 108
 Transactions of the Norfolk Society, 108
Dermaptera (Fasc. 122. Gen. Insect.), by M. Burr, D.Sc., 163
 Annals of Tropical Medicine and Parasitology, 164
 Butterfly-hunting in many Lands, by Dr. G. B. Longstaff, M.A., F.E.S., &c., 188
 British Butterflies, by A. M. Stewart, 212
 How to use the Microscope: A Guide for the Novice, by the Rev. C. A. Hall, 212
 Forty-second Annual Report of the Entomological Society of Ontario, 234
 Early Stages of our Dragonflies, by W. J. Lucas, B.A., F.E.S., 234
 Polymorphism in a Group of Mimetic Butterflies of the Genus *Pseudacraea*, by Prof. Poulton, 307
 Proceedings of the South London Entomological and Natural History Society, 1911-12, 308
 Catalogue of the Lepidoptera Phalaenæ in the British Museum, vol. xi., by Sir George Hampson, Bart., 308
 Annals of Tropical Medicine and Parasitology, vol. vi., Nos. 1-3, 350
 Memorias do Instituto Oswaldo Cruz (Año 1911), 350
 Two Insect Pests of the United Provinces—the Sugar-cane Grasshopper and the Potato Moth, by T. Barnbrigg Fletcher, R.N., 350
 Dragon Flies of the Cumberland Valley in Kentucky and Tennessee, by C. B. Wilson, 350
 The Proportion of the Sexes in *Forficula auricularia*, by H. H. Brindley, M.A., 350
 "Microscopes for Entomologists," 350
 The Humble-Bee, its Life-History, and how to Domesticate it, by F. W. L. Sladen, F.E.S., 350

- Transactions of the Carlisle Natural History Society (1912), 351
Rediscovery of the Braconid, *Meteorus vexator*, Hal., with Description of the Male, 4
Retinia (Rhyacionia) *purdeyi* in Norfolk, 327
Rhopalosiphum solani, Kalt., Notes on, 165
Rhyacionia (*Retinia*) *purdeyi*, Durrant, and R. logea, Durrant, 73
Scarcity of *Arctia caia* in 1912, 230
Second Brood of *Agrotis exclamatoris*, &c., 33; of *Apatura iris*, &c., 79
Second International Congress of Entomology, The, 268
Second List of Aphididae found in Kent, A, 20
Seitz's 'Macro-Lepidoptera of the World,' Notes on, 322
Sicily, Lepidoptera in, 281, 303
SOCIETIES:—
City of London Entomological, 104
Entomological of London, 39, 81, 101, 161, 186, 211, 328, 344
Lancashire and Cheshire Entomological, 45, 84, 139, 233, 349
Manchester Entomological, 45, 212, 233, 284
South London Entomological, 41, 103, 139, 187, 232, 284, 306, 346
Some Bees from Formosa, 9; of the Genus *Nomia* from Australia, 119
Spain — Albarracin, 112; Barcelona, 112
Sphinxotus serotinus, Grav., 78
Sphinx convolvuli reared from the egg, 29
Sphinx convolvuli and *Acherontia atropos* at Eastbourne, 79
Sphinx ligustri in May, 183
Spilosoma urticae in Isle of Wight, 209
Spring Lepidoptera, &c., in Essex, 1912, 208
Spring Brood of *Cyaniris argiolus*, 208
Stephens's Culicidae, Notes on, 277
Suffert Collection of Butterflies, The, 342
Supplementary Note on Hesperiid Classification, 5
Sweden—Abisko, 23, 65, 100; Jemtland, 23, 65
Sympetrum scoticum, Don., 157
Taniorhynchus richardii, Fic., in Middlesex and Hampshire, 327
Therosia punctularia in March, 183
Teratological Specimen of *Anthrocera filipendulae*, 106; of *Epinephele ianira*, 346; of *Carabus catenulatus*, 44; of *Mimas tiliae*, 44; of *Pimelia fornicata*, 44; of *Spilogaster uliginosa*, 44; of *Wheeleria spilodactyla*, 44
The Entomological Club, 138
The Genus *Ithysia*, Hübn., 315
The Larva of *Cardiophorus asellus* (Coleoptera), 189
The Summer of 1911 and the Present Season, 155
Thera variata in Britain (fig.), 241
Three Weeks in the High Pyrenees, 56
Thyatira batis in Isle of Skye, 279
Tortrix pronubana, 301, 326
Two Peculiar forms of *Boarmia repandata*, 94
Vanessa antiopa in Kent, 1911, 209; id, Note on, 100
Variation of *Eustroma reticulata*, Schiff., On the, 1,
VARIETIES:—
Abraxas grossulariata, 284
Acidalia incanaria, 105; *ornata*, 349
Adactylus bennettii, 38
Agriades corydon, 15, 43, 57, 349; *thetis*, 14
Anthrocera filipendulae, 44, 106
Apatura iris, 348
Argynnis euphrosyne, 32, 43, 105; *nohe*, 348
Boarmia repandata, 94
Brenthis euphrosyne, 43, 284; *selene*, 43, 316
Brephos parthenias, 181
Callimorpha dominula, 44
Catocala nupta, 44, 300
Colias nastes, 26
Conistra vaccini, 281
Cupido minimus, 15
Cyaniris argiolus, 106, 348
Drymonia chaonia, 106
Ematurga atomaria, 47
Ennomos quercinaria, 349
Ephyra annulata, 187; *pendularia*, 44, 232
Erebia euryale, 60
Eubolia bipunctaria, 105
Euchloe cardamines, 44, 104
Gnophos obscurata, 44
Heodes hippothoe, 345
Melanippe fluctuata, 46; *montanata*, 44
Melitaea aurinia, 105, 232; *parthenie*, 133
Nola cucullatella, 105
Eneis norma, 68
Parasemia plantaginis, 185
Pieris napi, 26, 105, 348
Polygonia c-album, 43
Polyommatus argus, 57; *icarus*, 15
Porthea similis, 44
Pyrameis atalanta, 104, 326, 343; *cardui*, 43
Rumicia phlaeas, 42, 43, 44, 103, 104, 266, 348
Satyrus semele, 348
Spilosoma lubricipeda, 106

<i>Strenia elathrata</i> , 46	West Surrey, Lepidoptera of, 184
<i>Urbicula comma</i> , 60	Westmoreland: Lepidoptera in 1911,
<i>Zonosoma linearis</i> , 3, 43; orbicularia, 43	158, 185, 210, 279
"Where Wallace Trod": An Entomological Trip to Mt. Serambu, Sarawak, 213, 246	Xanthorhoe (Melanippe) fluctuata in December, 80

PLATES.

	PAGE
I.—Aberrations of <i>Eustroma reticulata</i> and <i>Zonosoma linearis</i> to face	1
II.—Gavarnie, July, 1911: A Portrait Group	56
III. { Near Puerto de La Losillo, Sierra Albarracin	109
{ In the Camargue, near Les Saintes Maries	
IV. { <i>Gryllotalpa gryllotalpa</i> (Mole Cricket), wings spread	117
{ " " wings folded	
{ <i>Meconema thalassinum</i> , ovipositing	
V. { "Where Wallace Trod"	213
VI. { "Where Wallace Trod"	213
VII.—Pusztá Peszér	237
VIII.—Early Stages of <i>Hesperia linca</i>	253
IX. { Appendages of <i>Tapinostola concolor</i> , female, and <i>T. hell-</i>	285
{ <i>manni</i> , female and ova	
X.—Portrait of Professor E. B. Poulton	268
XI.—Valley of the Laxelv (habitat of <i>Colias hecla</i>)	
XII.—Dolomite Scree, Kolvik, Porsanger Fjord	309
XIII. { Forms of Scandinavian Diurni.	
XIV. { Forms of Scandinavian Diurni.	

ILLUSTRATIONS IN THE TEXT.

<i>Prisopus fisheri</i> , Gahan	55
Larva of <i>Eustroma reticulata</i>	85
<i>Rhopalosiphum solani</i> (structural details)	166, 167
The larva of <i>Cardiophorus asellus</i>	189
<i>Metrioptera roeselii</i>	224
<i>Thera variata</i>	243
<i>Theobaldia theobaldi</i> (Meij.) and <i>T. morsitans</i> (Theo.)	262

SPECIAL INDEX.

New Genera, Species, Sub-Species, and Varieties are marked with an asterisk.

Order III. THYSANURA.

saccharina (Lepisma), 139

Order VII. ORTHOPTERA.

- | | |
|---|--|
| <p>albipennis (Apterygida), 114, 164
 albopunctata { — grisea } (Metrioptera),
 225
 annulipes (Anisolabis), 164
 arachidis (Prolabis), 164
 auricularia (Forficula), 114, 164, 350
 auricularia var. forcipata (Forficula),
 114
 australasiae (Periplaneta), 103, 246
 bicolor (Stauroderus), 116
 bipunctatus (Tetrix), 116
 brachyptera (Metrioptera), 115, 207, 225
 brevipennis (Acrida), 119
 carlottæ (Prisopus), 54
 cavernicola (Ischnoptera), 246
 centurio (Opisthocosmia), 251
 chorea (Lonchæa), 346
 Cotylosoma, 49, 54
 crurifolium (Pulchriphyllium), 284
 dipneusticum (Cotylosoma), 53, 54
 *fisheri (Prisopus), 49, 54, 101
 flabelliformis (Prisopus), 51
 forcipatus (Cordax), 251
 fuliginosus (Tetrix), 117
 fuscifer (Hieroglyphus), 350</p> | <p>germanica (Blattella), 114, 184
 grossus (Mecostethus), 116
 gryllotalpa (Gryllotalpa), 115, 117
 guttata (Spodromantis), 284
 Hemimerus, 41
 horstokkii (Prisopus), 55
 lesnei (Forficula), 164
 lewisi (Anechura), 164
 maculatus (Gomphocerius), 115, 116
 maritima (Anisolabis), 164
 minor (Labia), 106, 114, 164
 morio (Chelisoches), 164
 morosus (Dixippus), 42
 orientalis (Blatta), 114, 347
 parallelus (Chorthippus), 116
 Prisopus, 49, 50, 51, 53, 54, 101
 riparia (Labidura), 76, 99, 164, 345, 349
 roeselii (Metrioptera), 116, 117, 118, 119,
 207, 224, 225, 348
 scabriuscula (Allodallia), 251
 sylvestris (Nemobius), 115
 thalassinum [= varium] (Meconema),
 115, 117
 vicinus (Timomenus), 251
 viridulus (Omocestus), 116</p> |
|---|--|

Order VIII. PLECOPTERA.

- | | |
|--|---|
| <p>dubitans (Nemoura), 93, 94
 fulviceps (Nemoura), 113
 grammatica (Chloroperla), 113</p> | <p>inconspicua (Nemoura), 94
 marginata (Perla), 113
 variegata (Nemoura), 94</p> |
|--|---|

Order X. ISOPTERA (TERMITES).

flavipes (Termes), 272

Order XIII. ODONATA. [= PARANEUROPTERA.]

- acutipennis* (*Platycnemis*), 110, 111
ænea (*Cordulia*), 141, 174, 201
Æschna, 84, 173
affinis (*Æschna*), 110, 111
alpestris (*Somatochlora*), 327
annulatus (*Cordulegaster*), 31, 111, 112, 142, 149, 171, 172, 202
annulatus var. *immaculifrons* (*Cordulegaster*), 111, 112
armatum (*Agrion*), 235
arctica (*Somatochlora*), 235
barbara (*Lestes*), 110, 111, 112
brunneum (*Orthetrum*), 110, 112
cærulea (*Æschna*), 172, 235, 327
cærulescens (*Orthetrum*), 110, 112, 143, 149, 174, 201
cancellatum (*Orthetrum*), 110, 111, 112, 201
curtisii (*Oxygastra*), 110, 112
cyanea (*Æschna*), 112, 149, 172, 174, 202
cyathigerum (*Enallagma*), 141, 172, 175, 202, 234
danæ (*Libellula*), 151
danæ (*Sympetrum*), 151, 173
depressa (*Libellula*), 112, 141, 142, 174, 201
dryas (*Lestes*), 112, 174, 235
elegans (*Ischnura*), 84, 111, 142, 149, 172, 173, 175, 202, 234
elegans var. *rufescens* (*Ischnura*), 149, 172, 175
erythraea (*Crocothemis*), 110, 111, 112
flavolum (*Sympetrum*), 112, 143, 144, 173, 235
flavipes (*Gomphus*), 110, 111
fonscolombii (*Sympetrum*), 112, 114, 130, 143, 144, 172, 234
fulva (*Libellula*), 110, 111, 112, 142, 201, 235
fusca (*Sympycna*), 110, 111, 112
grællsi (*Ischnura*), 112
grandis (*Æschna*), 149, 172, 173, 174, 175, 202
hæmorrhoidalis (*Calopteryx*), 110, 111, 112
hafniense (*Brachytron*), 174
hastulatum (*Agrion*), 172, 235
imperator (*Anax*), 110, 111, 112, 202
isoseles (*Æschna*), 111
junceæ (*Æschna*), 149, 171, 172, 202
latipes (*Platycnemis*), 110, 111, 114
Libellula, 84
lindenii (*Agrion*), 110, 111, 114
Macromia, 109
mercuriale (*Agrion*), 110, 111, 142, 174, 202
meridionale (*Sympetrum*), 112
metallica (*Somatochlora*), 174
mixta (*Æschna*), 111, 112, 174, 202
naïas (*Erythromma*), 173, 175
**nigrescens* (*Sympetrum*), 171
nympha [= *dryas*] (*Lestes*), 235
nymphula (*Pyrrhosoma*), 141, 142, 149, 172, 175, 185, 202
parthenope (*Anax*), 110, 111
pennipes (*Platycnemis*), 110, 142, 173
pratense (*Brachytron*), 142, 149, 172, 202
puella (*Agrion*), 111, 112, 142, 172, 175, 202
pulchellus (*Gomphus*), 110, 111
pulchellum (*Agrion*), 111, 142
pumilio (*Ischnura*), 142
quadrinaculata (*Libellula*), 111, 112, 141, 142, 149, 171, 172, 201
quadrinaculata var. *prænubila* (*Libellula*), 112
sanguineum (*Sympetrum*), 111, 112, 143, 174, 235
scoticum (*Sympetrum*), 149, 151, 152, 171, 172, 173, 201
simillimus (*Gomphus*), 110, 111
splendens (*Calopteryx*), 110, 111, 112, 114, 149, 174, 175, 202
splendens, race *xanthosoma* (*Calopteryx*), 110, 112
splendens (*Macromia*), 109
sponsa (*Lestes*), 111, 142, 171, 172, 202
striolatum (*Sympetrum*), 112, 142, 143, 171, 172, 173, 175, 201
Sympetrum, 84
tenellum (*Pyrrhosoma*), 110, 111, 141, 174, 175, 202
uncatus (*Onychogomphus*), 112
virgo (*Calopteryx*), 31, 142, 174
viridis (*Lestes*), 110, 111
viridulum (*Erythromma*), 110, 111
vulgatum (*Sympetrum*), 171, 234

Order XIV. THYSANOPTERA.

- Hoodia*, 162
Liothrips, 162
nobilis (*Megalothrips*), 328

Order XV. HEMIPTERA.

- abdominalis* (*Serinetha*), 250
affinis (*Pemphigus*), 22
albiguttata (*Mauna*), 249
albipes (*Psylla*), 187
alni (*Callipterus*), 21
Aphidioides, 21
Aristaphis, 21
arundinis (*Hyaloptera*), 342
auratus (*Chrysochoris*), 250
basinotata (*Suracarta*), 250
beryllus (*Z.*), 252
betularius (*Callipterus*), 21
betulicolæ (*Callipterus*), 21
biplagiata (*Narbo*), 250
Bucktonia, 22
bursarius (*Pemphigus*), 346
Byrsocrypta, 22
Callipterus, 21
capræ (*Chaitophorus*), 21
capini (*Callipterus*), 21
castanææ (*Callipterus*), 21
Chaitophorus, 20
Cladobius, 21
convergens (*Ricania*), 250
corni (*Schizoneura*), 22
coryli (*Callipterus*), 21
crassa (*Z.*), 252
crocea (*Scicroptera*), 249
Dactylopius, 162
delineata (*Tricoxarta*), 250
Delphax, 341, 342
dianthi (*Rhopalosiphum*), 165, 166, 167, 168
dilineatus (*Hyalopterus*), 20
dislocata (*Phymatostetha*), 250
Drepanidosiphum, 21
dryophila (*Vacuna*), 22
fabæ (*Aphis*), 165
farinosa (*Tettigoniella*), 250
filaginus (*Pemphigus*), 22
fimbriata (*Plautia*), 250
Flata, 344
flavus (*Hyalopterus*), 20
**fragariæ* (*Myzus*), 229
fullo (*Erthesina*), 47
fuscata (*Pochazia*), 250
gnaphalium (*Pemphigus*), 22
graminis (*Rhizobius*), 22
graminis (*Rhizoicus*), 22
humuli (*Aphis*), 165
Hyalopterus, 20
Kallistaphis, 21
Lachnus, 22
lactuarius (*Pemphigus*), 22
lanigera (*Schizoneura*), 165
laricis (*Chermes*), 229
**liberiana* (*Platypleura*), 200
limitaris (*Ricania*), 250
Macrosiphum, 273
makaga (*Platypleura*), 201
marsupialis (*Pemphigus*), 22
megistus (*Conorhinus*), 47, 48
**montivagus* (*Glaucias*), 252
Myzocallis, 21
nigronotatus (*Thessitus*), 250
oculata (*Dalpada*), 250
Pemphigus, 22
persicæ (*Aphis*), 165
picus (*Cimex*), 252
picus (*Halyomorpha*), 252
platanoides (*Drepanidosiphum*), 21
populeus (*Aphidioides*), 21
populeus (*Cladobius*), 21
populi (*Chaitophorus*), 21
Psylla, 276
Pterocallis, 21
Pterocomma, 21
pulchellus (*Aræopus*), 341
pulchellus (*Delphax*), 341
pyriformis (*Pemphigus*), 22
quercus (*Callipterus*), 21
raphæ (*Aphis*), 165
Rhizobius, 22
Rhizoicus, 22
salicivorus (*Chaitophorus*), 21
Schizoneura, 22
**scutellatus* (*Hippotiscus*), 251
semiclara (*Bhandara*), 250
signoreti (*Centrocnemis*), 250
simulans (*Opistharsotheus*), 250
solani (*Aphis*), 165
solani (*Rhopalosiphum*), 165
spirothecæ (*Pemphigus*), 346
stellata (*Phymatostetha*), 250
superba (*Phromnia*), 344
tomentosus (*Lachnus*), 22
tricolor (*Suracarta*), 250
trimaculata (*Dalpada*), 251
trimaculata (*Pentatoma*), 251
Tuberculatus, 21
Vacuna, 22
vastator (*Aphis*), 165
versicolor (*Chaitophorus*), 20

Order XVI. NEUROPTERA.

- appendiculatus* (*Macronemurus*), 113
Barbara (*Lertha*), 39
bipennis [= *Iusitanica*] (*Nemoptera*), 39
bœticus (*Ascalaphus*), 112
Chrysopa, 347
chrysops (*Osmylus*), 221
cognata (*Panorpa*), 222, 328
cognata (*Raphidia*), 221
communis (*Panorpa*), 222, 321
concinus (*Hemerobius*), 222

flava (Chrysopa), 222
fuscata (Sisyra), 221
germanica (Panorpa), 40, 222, 322
hiemalis (Boreas), 42
humuli (Hemerobius), 113, 222
ictericus (Ascalaphus), 110
lineolata (Chrysopa), 113
longicornis (Ascalaphus), 111, 112, 113
lutaria (Sialis), 188, 221
lutescens (Hemerobius), 222
meridionalis (Dilar), 113
micans (Hemerobius), 222

nervosus (Hemerobius), 222
nitidulus (Hemerobius), 222
notata (Raphidia), 221
orotypus (Hemerobius), 222
perla (Chrysopa), 222
plumbeus (Creagris), 113
prasina (Chrysopa), 113
septempunctata (Chrysopa), 222
stigma (Hemerobius), 113, 221, 222
subnebulosus (Hemerobius), 222
vulgaris (Chrysopa), 113
xanthostigma (Raphidia), 221

Order XVII. TRICHOPTERA.

fragilis (Metalype), 113
guttata (Hydropsyche), 113
instabilis (Hydropsyche), 113

lepida (Hydropsyche), 113
vittatum (Sericostoma), 113

Order XVIII. LEPIDOPTERA.

abietaria (Boarmia), 188, 245
abjecta (Mamestra), 32, 187, 203, 204, 227
ablatrix (Pencillaria), 308
abruptaria (Hemerophila), 208
acacia (Strymon), 97
acanthodactyla (Amblyptilia), 154
accipiter (Epilecta), 131
acciusalis (Ramila), 249
aceriana (Hedya), 38
**aclea* (Zamarada), 200
Acræa, 41, 83
**acritoides* (Acræa), 41
actæa (Satyrus), 134
actæon (Hesperia), 254, 255, 256
actæon (Thymelicus), 60, 96
actuaria (Craspedia), 249
adippe (Argynnis), 97, 158, 202, 279, 302
admetus (Polyommatus), 97
adrasta (Pararge), 62
adulatrix (Eurhipia), 308
adulatrix (Eutelia), 308
adustata (Ligdia), 208, 349
advena (Aplecta), 45, 179
advenaria (Epione), 32
advenella (Eurhodope), 37
advenella (Rhodophæa), 37
adyte (Erebina), 67
Ægeria, 43, 44
ægidion (Plebeius), 65
ægimiusalis (Piletocera), 249
ægon (Lycæna), 84, 280
ægon (Plebeius), 37, 97
æqualis (Eugoa), 249
**ærata* (Archana), 148
æscularia (Anisopteryx), 159
æsculi (Zeuzera), 180
æstiva (Leptosia), 187
æthiops (Erebina), 43, 83, 102, 157
affinis (Calymnia), 31, 227

affinis (Horagia), 248
affinitata (Larentia), 100
affinitata (Perizoma), 136, 153
agatha (Neptis), 186
agathina (Agrotis), 47, 160, 280, 349
agathyrus (Alcides), 234
agestis (Lycæna), 157, 185
aglaia (Argynnis), 62, 97, 343
agnes (Eucherodes), 169
agramella (Coleophora), 284
Agriades, 15
ajax (Papilio), 44
alba (Colias), 323
alba (Rumicia), 103, 104
**alberta* (Acræa), 41
albicans (Lymantria), 249
albicillata (Melanthia), 157, 179
albicincta (Polyommatus), 57
albicolon (Melanchra), 180
albida (Epinephele), 323
albidus (Epinephele), 323
**albigutta* (Perigea), 133
albipuncta (Leucania), 348
albipunctella (Depressaria), 30
albistria (Argyresthia), 38
albitarsella (Coleophora), 38
albovenosa (Arsilonche), 46, 292
albulalis (Nola), 349
albulata (Emmelesia), 69, 106
alcææ (Carcharodus), 16
alcææ (Erynnis), 96
alcella (Chrosis), 38
alchemillata (Emmelesia), 157
alcinoë (Planema), 102
alciphron (Loweia), 60, 97
alcon (Lycæna), 15
alcione (Satyrus), 60, 133
alcyonipennella (Coleophora), 38
alecto (Erebina), 59
Aletis, 161

- alexandra (Colias), 323
 alexanor (Papilio), 97, 347
 alexis (Lycæna), 30, 35
 alexius (Agriades), 345, 348
 alexius (Polymmatas), 331
 algerica (Hipparchia), 44
 aliris (Thaumantis), 247
 alni (Acronycta), 129
 alniaria (Eugonia), 293
 Alotsa, 308
 alphasalis (Bertula), 249
 alpina (Agrotis), 343
 alpina (Hesperia), 7, 78
 alpina (Ithysia), 315, 316, 317, 318, 319, 320, 321
 alpinaria (Ithysia), 316, 317, 318
 alpinellus (Crambus), 295, 296
 alsines (Caradrina), 37
 alstrømeriana (Depressaria), 38
 alternata (Semiothisa), 127
 althæa (Carcharodus), 60
 alticola (Hepialus), 58
 alveolus (Hesperia), 154
 alveus (Hesperia), 6, 59, 78, 137
 amata (Sinthusa), 248
 amataria (Timandra), 33, 180, 203, 204, 227, 228, 264, 297
 ambigua (Caradrina), 32
 amethystus (Zeuxidia), 247
 amphidamas (Chrysophanus), 65, 310
 anceps (Mamestra), 179
 anderregiella (Argyresthia), 38
 andrei (Cricula), 284
 andreniformis (Ægeria), 233
 andromedæ (Hesperia), 59, 69
 anemosa (Acraea), 83
 angustana (Eupœcilia), 30
 angustana (Hypermezia), 38
 angrusalis (Pilocrocis), 249
 annulata (Ephyra), 127, 187
 anomala (Hypolimnas), 247
 anthedon (Euralia), 161
 antiopa (Eu Vanessa), 61, 133
 antiopa (Vanessa), 35, 36, 105, 209, 227
 antiphus (Papilio), 248
 aphirape (Brenthis), 25, 65
 apicalis (Ilema), 248
 apicella (Coleophora), 347
 apiciaria (Epione), 80, 161, 228, 292
 apiformis (Trochilium), 179, 180, 202
 apollo (Parnassius), 61, 97, 305
 applana (Depressaria), 30, 38, 188
 *approximaria (Urapteryx), 168
 approximata (Atacira), 308
 aprilina (Agriopsis), 281, 296
 aquilo (Latorina), 309, 314
 arbuti (Heliodina), 136, 308
 arcania (Cænonympha), 62, 134, 306, 307
 archesia (Precis), 83
 archippus (Anosia), 105
 arctica (Agrotis), 100
 *arctica (Pieris), 338
 arcuana (Roxana), 153
 arenella (Depressaria), 80
 *arenosa (Agrotis), 130, 279
 areola (Lithomia), 153
 areola (Xylocampa), 84
 arete (Aphantopus), 279
 arethusa (Hipparchia), 16, 17, 134
 arge (Melanargia), 283, 305
 argentimaculella (Tinea), 37
 argentula (Bankia), 46
 argiades (Everes), 15, 17, 97, 248
 argiades (Lycæna), 35, 298
 argillacea (Alabama), 273
 argiolus (Celastrina), 17, 97, 157, 207, 310, 345, 347, 348
 argiolus (Cyaniris), 29, 35, 106, 128, 135, 157, 182, 203, 208, 231
 argiolus (Lycæna), 208
 argiolus (Lycænopis), 182
 argus (Plebeius), 37, 57, 59, 97
 argyrogonomon (Plebeius), 65, 97
 arion (Lycæna), 15, 16, 61, 97, 345, 348
 aristolochia (Papilio), 248
 armoricanus (Hesperia), 7
 arundineta (Nonagria), 203, 204, 227, 290
 arundinis (Nonagria), 293, 294
 asella (Heterogenea), 129
 asella (Limaecodes), 302
 ashworthii (Agrotis), 45, 46, 349
 asinalis (Botrys), 30
 aspasia (Danaïs), 247
 aspersana (Peronea), 37, 38
 assimilata (Eupithecia), 268
 associata (Cidaria), 158
 asteris (Cucullia), 180, 297
 astrarche (Aricia), 207
 astrarche (Lycæna), 157
 astrigera (Acraea), 41
 Atacira, 308
 atalanta (Pyrameis), 17, 18, 19, 30, 31, 36, 104, 133, 138, 182, 187, 208, 228, 230, 266, 278, 296, 297, 298, 303, 324, 325, 326, 328, 343
 athalia (Melitæa), 133, 232
 atomaria (Eimaturga), 47, 108, 154, 179
 atra (Laverna), 38
 atrata (Tanagra), 157
 atrella (Gelechia), 333
 atricapitana (Eupœcilia), 36, 295
 atricapitana (Phalonia), 36, 37, 38
 atricommella (Elachista), 39
 atropos (Acherontia), 79, 100, 104, 106, 182, 209
 atropos (Manduca), 182, 183, 348
 augur (Noctua), 159, 178
 aurago (Xanthia), 46
 aurantiaria (Hybernia), 296, 297
 aurata (Pyrausta), 30, 293
 aurelia (Melitæa), 163
 aureoflavescens (Anthocharis), 323
 *aureola (Acraea), 41
 aureolalis (Pionea), 249
 aurifrontella (Chrysoclista), 36
 aurinia (Melitæa), 105, 133, 187, 232
 aurivillius (Colias), 323

- australis (Hesperia), 7
 autumnaria (Ennomos), 45
 autumnaria (Oporabia), 162
 aversata (Acidalia), 79, 279
 aversata (Ptychopoda), 4
 avis (Callophrys), 162, 188
 badiana (Argyrolepis), 37
 badiana (Phalonia), 37
 badiata (Anticlea), 179, 208
 badiipenella (Coleophora), 328
 baia (Noctua), 135, 203, 227, 228
 baluana (Amnosia), 247
 barbalis (Hypæna), 153
 barcealis (Agrotera), 249
 barrettii (Dianthæcia), 284
 basilinea (Apamea), 178
 *basinotata (Alcis), 91
 *basistrigaria (Lygris), 170
 *bathyscaphes (Zamarada), 196, 199
 batis (Thyatira), 46, 249, 279
 belina (Hestia), 233
 bellargus (Agriades), 14
 bennettii (Adactylus), 38
 bennettii (Agdistis), 38
 bentleyana (Rhyacionia), 74, 75
 betulæ (Ornix), 349
 betulæ (Thecla), 154
 betulæ (Zephyrus), 35, 128, 227, 302
 betuletana (Penthina), 292
 betularia (Amphidasys), 135, 153, 234
 bianca (Chionama), 248
 bicolorana (Hylophila), 129
 bicolorata (Miana), 293
 bicoloria (Miana), 38, 295
 bidentata (Conodontis), 47, 160
 bidentata (Odontopera), 95, 137
 bifasciana (Sericofera), 295
 bifida (Cerura), 183
 bifida (Dicranura), 106, 306
 bilineata (Camptogramma), 180, 241, 280
 bilunaria (Selenia), 38, 46, 160, 292
 binævella (Homocosoma), 267
 binaria (Drepana), 295
 bipunctaria (Eubolia), 38, 105
 bipunctata (Senta), 204
 bipunctidactyla (Mimæsiptilus), 38
 *bipupillata (Eueis), 68
 birdella (Ochsenheimeria), 38
 bischoffaria (Acidalia), 105
 bisetata (Acidalia), 279
 bistortata (Prothosia), 100
 bizonoides (Asura), 218
 blandina (Erebia), 157
 blomfieldii (Smyrna), 347
 boëticus (Lampides), 15, 17
 boisduvali (Hewitsonia), 187
 boisduvalii (Opsiphanes), 347
 bombycaria (Ithysia), 316
 bombyliiformis (Hemaris), 310
 bondii (Tapinostola), 105
 bore (Eueis), 25, 68
 borealis (Brenthis), 66, 67
 borealis (Phragmatobia), 100
 borneensis (Parthenos), 248
 bracteata (Mireia), 249
 bracteolalis (Eurrhynchos), 249
 brassicæ (Mamestra), 33, 228, 281
 brassicæ (Pieris), 26, 34, 35, 97, 135, 159, 280, 302, 322, 343
 brevicornis (Baronia), 163
 *brevifasciata (Ectropis), 69
 brevilinea (Nonagria), 291, 292, 293, 294
 briseis (Hipparchia), 16, 134
 briseis (Satyrus), 113
 *britannica (Ithysia), 316, 321
 brumata (Cheimantobia), 297
 brumata (Halia), 45
 *brunnea (Acraea), 41
 brunnea (Noctua), 127, 159
 brunnearia (Selenia), 46
 bryonia (Pieris), 265, 331, 338, 346
 bucephala (Phalera), 297
 buoliana (Rhyacionia), 74, 75
 burrowsi (Hydrocia), 330
 butesalis (Simplicia), 249
 buxtoni (Kallima), 218
 c-album (Polygonia), 17, 34, 35, 43, 133
 c-nigrum (Noctua), 31, 33, 179, 228, 265, 267, 281, 297
 cæcilia (Erebia), 58, 59, 60
 cærulea (Colias), 323
 cærulea (Polygonatus), 65
 cæruleopuncta (Rumicia), 103, 104, 105, 340, 348
 cæsiata (Entephria), 47, 160, 211
 cæsiata (Larentia), 45, 69
 caia (Arctia), 44, 187, 203, 230, 323
 caicus (Grammodia), 40
 caledonia (Erebia), 43, 83, 102
 caledonia (Pararge), 83
 caliginosa (Arctia), 301
 callandra (Actias), 46
 callidice (Pontia), 61
 Callidryas, 19, 346
 callunaria (Eupithecia), 349
 camelina (Lophopteryx), 32, 46, 157, 280
 camilla (Limenitis), 133, 323
 cana (Catoptria), 37
 candidata (Acidalia), 153
 canescens (Adolias), 248
 canteneri (Thais), 45
 capsicola (Dianthæcia), 32, 345, 347
 capsophila (Dianthæcia), 46, 345, 347
 captiuncula (Phothedes), 157
 capucina (Miselia), 281
 carbonaria (Fidonia), 100
 cardamines (Euchloc), 43, 44, 104, 135, 159, 181, 182, 207, 208, 231, 232, 310
 cardui (Pyrameis), 17, 42, 43, 61, 82, 133, 156, 182, 208, 209, 228, 230, 265, 266, 278, 297, 298, 299, 300, 323, 324, 325, 343, 344, 346, 347
 Carex, 308
 carlinæ (Hesperia), 96
 carnana (Amaurinia), 204

- *carniolica* (*Ithysia*), 319, 321
carniolica (*Zygæna*), 305
carpini (*Saturnia*), 135, 203, 232
carpophaga (*Dianthœcia*), 32, 44, 296, 345, 347
carthami (*Hesperia*), 61, 96
cassioides (*Erebia*), 58, 134
cassiope (*Erebia*), 58, 158, 210, 333, 334, 335, 336
cassiusalis (*Bertula*), 249
castanea (*Noctua*), 160, 280
**castanea-punctata* (*Colias*), 27
castrensis (*Malacosoma*), 180
catena (*Augiades*), 69
Catophaga, 39
Catopsilia, 19
cecropia (*Philosamia*), 42, 346
celeno (*Lampides*), 248
celestina (*Tachyris*), 39
celtis (*Libythea*), 305, 346
cenen (*Papilio*), 83, 271
centaureæ (*Hesperia*), 25, 68, 69, 310
cephalaris (*Saturnia*), 212
cerago (*Xanthia*), 268
cerinus (*Zygæna*), 323
cæri (*Strymon*), 97
cesonia (*Colias*), 323
cesonia (*Meganostoma*), 323
cespitis (*Luperina*), 31, 32
ceto (*Erebia*), 163, 335
chamomillæ (*Cucullia*), 34, 180
chaonia (*Drymonia*), 31, 160, 181, 183
chaonia (*Notodonta*), 185
Charaxes, 233
chariclea (*Brenthis*), 309, 337
chenopodii (*Hadena*), 33, 180
chi (*Polia*), 30, 45, 139, 281, 348
chlorana (*Euarias*), 308
Chlosyne, 151
christiennella (*Hypercallia*), 332
christiennæsoni (*Colias*), 27
chrysippus (*Danaïs*), 324
chrysis (*Plusia*), 31, 32, 227, 268
chrysorrhœa (*Euproctis*), 184, 230
chrysorrhœa (*Liparis*), 230
chrysorrhœa (*Porthesia*), 348
cinctalis (*Spilodes*), 203
cinctaria (*Boarmia*), 157, 233
cinerea (*Acræa*), 41
cinerea (*Agrotis*), 32, 183
cinerella (*Brachycrossata*), 37
cinerella (*Recurvaria*), 37
cingulalis (*Ennychia*), 38
cinxia (*Melitæa*), 16, 17, 133, 232
cinxioides (*Melitæa*), 133
circe (*Satyrus*), 133, 303
circeis (*Acræa*), 83
circellaris (*Amathes*), 265, 281
circellaris (*Orthosia*), 265
circii (*Hesperia*), 96
circulana (*Eucosma*), 75
circumscripita (*Simplicia*), 249
clararia (*Ophthalmodes*), 249
clathrata (*Chiasmia*), 280
clathrata (*Strenia*), 46
claudius (*Euploea*), 247
**clava* (*Trigonophora*), 147
cleodoxa (*Argynnis*), 97
cleopatra (*Gonepteryx*), 44, 97, 232
clivalis (*Dichocrocis*), 249
codina (*Agatheia*), 249
cæcilia (*Erebia*), 145
cælestis (*Agriades*), 14, 15
Cænonymphe, 306
Colias, 125, 349
colorata (*Miana*), 203
comariana (*Peronea*), 139
comes (*Triphæna*), 292
comitata (*Pelurga*), 204
comma (*Augiades*), 69
comma (*Leucania*), 32, 178
comma (*Urbicula*), 60
commixta (*Papilio*), 186
compactaria (*Boarmia*), 249
comparataria (*Paradarisa*), 258
complana (*Lithosia*), 180, 295
complanula (*Lithosia*), 36, 38, 204
compositella (*Stigmonota*), 37, 38
concinata (*Cidaria*), 82
concinata (*Dysstroma*), 82
conclusa (*Chionæma*), 248
concolor (*Tapinostola*), 104, 256, 285, 286, 287
conferta (*Pomasia*), 249
conflua (*Agrotis*), 100
confluens (*Anthrocera*), 104
confluens (*Zygæna*), 209
conformis (*Xylina*), 41, 184
conigera (*Lucania*), 180, 203
**conjuncta* (*Alcis*), 90
**connexa* (*Colias*), 27
consoletaria (*Boarmia*), 79, 80
conspersa (*Dianthœcia*), 32
conspersana (*Sciaphila*), 38
conspicillaris (*Xylomiges*), 105
constricta (*Lygris*), 170
contaminei (*Anthrocera*), 57, 59
contigua (*Mamestra*), 46, 127
contiguaria (*Acidalia*), 47, 140
continua (*Ariola*), 249
continuata (*Neptis*), 186
conversaria (*Boarmia*), 43, 45
**convexa* (*Lygris*), 170
convolvuli (*Agrius*), 44
convolvuli (*Sphinx*), 29, 32, 79, 100, 106, 264, 266, 267
coracina (*Psodos*), 100
cordigera (*Anarta*), 69
cordula (*Satyrus*), 133
coretas (*Everes*), 97
coridon (*Agriades*), 43, 347, 348, 349
coronata (*Eupithecia*), 38
corticea (*Agrotis*), 32
coruscans (*Lampides*), 248
corydon (*Agriades*), 15, 17, 43, 44, 57, 97, 146
corydon (*Lycæna*), 46, 301
corylata (*Cidaria*), 153

- coryli (Demas), 183
 cosmius (Xylophanes), 40
 costalis (Ilema), 248
 costana (Tortrix), 154, 178, 234, 349
 costaria (Boarmia), 249
 *costimacula (Alcis), 72
 *costimacula (Eustroma), 3
 costleyi (Mimacraea), 328
 costovata (Melanippe), 46
 crabroniforme (Trochilium), 210
 cramerella (Lithocolletis), 349
 crassistriga (Pachyodes), 259
 crategata (Runia), 208
 cratægi (Aporia), 97, 126, 158, 301, 302
 crepuscularia (Tephrosia), 79, 160, 161
 crepuscularis (Nyctipao), 249
 crinigera (Bauiana), 249
 crishna (Neorina), 316
 croceago (Oporina), 84
 crocealis (Ebulca), 36, 266
 croceus (Colias), 323
 cræsus (Ornithoptera), 188
 cruciata (Miltchrista), 249
 cruda (Teniocampa), 159
 cubicularis (Caradrina), 31
 cucubali (Dianthæcia), 32, 183, 211, 296
 cucullata (Nola), 105
 cuculoides (Stictoptera), 308
 culmellus (Crambus), 290
 cuneifera (Asura), 248
 cuneiplana (Darantasia), 248
 cuneonotata (Miltchrista), 249
 curtisellus (Prays), 38
 curtula (Pygæra), 80
 cyllaris, 281
 cyllaris (Glaucopsyche), 310
 cyparissus (Polymnatus), 65
 cytisaria (Pseudoterpna), 136, 180
 dahlii (Noctua), 280
 damon (Polymnatus), 97, 146, 348
 damone (Euchloe), 44, 282, 328
 duos (Ideopsis), 217
 daphne (Brenthis), 97
 daplidice (Pontia), 16, 17, 62, 97, 278
 dardanus (Papilio), 83, 162, 270, 288, 324
 deauratella (Coleophora), 344
 debora (Eumæus), 284
 decolorata (Hydriomene), 37
 decolorata (Perizoma), 3, 153
 defoliaria (Hybernia), 104, 136, 296, 297
 deione (Melitæa), 133
 delamerensis (Tephrosia), 79
 deleta (Abraxas), 105
 deliaria (Problepsis), 249
 Dolias, 40
 dentata (Hipparchia), 134
 dentina (Hadena), 32, 157, 178, 179
 deplana (Lithosia), 41, 103
 derivalis (Herminia), 203
 derivata (Anticlea), 208
 desertella (Gelechia), 38
 designata (Coremia), 157, 160, 161, 292
 deversaria (Ptychopoda), 4
 dharma (Cirphis), 132
 dia (Brenthis), 62, 97
 Dianthæcia, 345
 dictæa (Notodonta), 31
 dictæa (Pheosia), 183
 dictæoides (Notodonta), 160, 183
 dictæoides (Pheosia), 80, 211, 280
 dictynna (Melitæa), 62
 didyma (Apamea), 292, 295
 didyma (Melitæa), 17, 62, 133
 dilutata (Oporabia), 162, 281, 296, 297
 dimidiata (Acidalia), 33, 289
 diniensis (Leptosia), 187
 diorea (Thaumantis), 347
 disa (Erebia), 309, 312
 discibrunnea (Daseochæta), 132
 discistriga (Alotsa), 308
 discordella (Coleophora), 37
 dispar (Chrysophanus), 103, 156
 dispar (Porthetria), 331
 dissimilis (Mamestra), 45, 46
 *distincta (Colias), 340
 ditrota (Luxiaria), 249
 diversipennis (Risoba), 249
 *divisa (Alcis), 91
 dodonea (Drymonia), 31
 dodoneata (Eupithecia), 135
 dolobraria (Eurymene), 32, 46, 153, 160
 domestica (Gelechia), 37, 38
 dominula (Callimorpha), 44, 303, 347
 dorilis (Chrysophanus), 283
 dorilis (Lowea), 36, 97
 dorippus (Danais), 321
 dorsigera (Toxocampa), 249
 dorus (Cænonympha), 134, 307
 dotata (Cidaria), 158, 180, 203
 doubledayaria (Amphidasys), 135, 234
 doubledayi (Zeuxidia), 247
 doxo (Pinacopteryx), 328
 dromedarius (Notodonta), 129, 159
 dromus (Erebia), 58
 dryas (Ennodia), 131
 dryope (Eurytela), 163
 dubia (Euralia), 161
 dubitata (Triphosa), 160, 185
 dumerilii (Luperina), 43
 duplana (Retinia), 74
 duplaris (Cymatophora), 32, 178
 duplaris (Palimpsestis), 178
 duplicana (Padenia), 248
 duponcheli (Leptosia), 97, 187
 d'urvilleana (Ornithoptera), 234
 Earias, 308
 ectypa (Leucania), 62
 edua (Colias), 16, 17, 19, 42, 97, 181, 182, 187, 207, 230, 231, 232, 278, 282, 284, 298, 299, 327, 339, 342, 343, 347, 348, 349
 edwardsi (Colias), 323
 effortalis (Agrotæra), 249
 ega (Catophaga), 39
 egea (Polygonia), 133, 283
 egenaria (Syntomis), 248

- egeria (Pararge), 30, 34, 35, 126, 128,
 133, 155, 207, 231, 232, 299, 343
 egerides (Pararge), 207, 231
 egialea (Amauris), 187
 Eleale, 308
 electo (Colias), 323
 eleus (Chrysophanus), 266
 eleus (Rumicia), 43, 104, 105
 elinguaris (Crocalis), 135
 *ella (Acraea), 41
 elpenor (Chærocampa), 46, 294
 eltringhami (Mimacraea), 328
 elutalis (Erebia), 249
 elutata (Hydriomene), 299
 elymi (Tapinostola), 295
 emarginata (Acidalia), 33, 180, 201, 267,
 292, 297
 emberizipenella (Lithocolletis), 38
 embla (Erebia), 67, 310
 emesiodides (Zemeros), 248
 emutaria (Acidalia), 32, 180, 264
 Ephestia, 348
 Epiblema, 75
 epiphron (Erebia), 45, 46, 57, 145, 333,
 334, 335, 336
 Erebia, 56, 163
 erecta (Kodaria), 249
 ericetana (Orthotænia), 38
 ericetata (Selidosoma), 280
 eriopsis (Epiphele), 284
 erippus (Anosia), 105
 eris (Argynnis), 348
 Erites, 217
 eros (Polyommatus), 58
 erymanthis (Cupha), 247
 escheri (Polyommatus), 15, 61, 97, 348
 eso (Zemeros), 248
 Eulia, 74
 eulimene (Calopieris), 330
 eupheme (Zegris), 44, 45, 78
 euphorbiæ (Deilephila), 35
 euphrosyne (Argynnis), 32, 84, 105, 136,
 153, 154, 184, 277, 305, 349
 euphrosyne (Brenthis), 43, 62, 67, 284
 Euplœa, 103
 euprepoides (Asura), 248
 Eurhipia, 308
 eurota (Eunica), 347
 euryale (Erebia), 60
 euryaloides (Erebia), 60
 eurytheme (Colias), 323
 eurytus (Pseudacraea), 307
 Eutela, 308
 evemon (Papilio), 139
 Evetria, 75
 excelsior (Isognathus), 40
 exclamatoris (Agrotis), 179, 228, 281,
 300
 exigua (Laphygma), 44, 184
 exoleta (Calocampa), 159, 268, 281
 expallidana (Eucoema), 39
 extensaria (Eupithecia), 106, 296
 *extincta (Ithysia), 317
 extranea (Leucania), 326
 exulans (Anthrocera), 57, 59
 exulans (Zygæna), 45, 69
 exulis (Crymodes), 347
 fagaria (Scodionia), 161
 fagella (Diurnea), 208
 fagi (Stauropus), 129, 183
 faginella (Lithocolletis), 37
 fulcataria (Drepana), 45, 129, 292
 fascelinellus (Crambus), 279, 290
 fasciana (Erastria), 153
 fasciana (Hapalotis), 178
 *fasciata (Brenthis), 66
 fasciata (Chrysophanus), 323
 fasciata (Spilosoma), 106
 *fasciata (Zonosoma), 4
 fasciuncula (Miana), 179
 fauculalis (Mabna), 249
 faunula (Urbicula), 60
 fausta (Anthrocera), 16
 favicolor (Leucania), 42, 62, 63, 101,
 102, 106, 108, 179, 180, 203, 228, 264,
 265, 297
 ferrugalis (Scopula), 349
 ferrugata (Coremia), 34, 135, 157, 161,
 346
 ferrugata (Larentia), 100
 ferruginella (Blabophora), 37
 *fessa (Zamarada), 199
 festiva (Noctua), 159, 178
 festuæ (Plusia), 279, 292, 349
 fibrosa (Apamea), 44, 292
 fibula (Adela), 36
 ficklini (Dianthocia), 284, 348
 tidia (Hipparchia), 134
 filigrammaria (Oporabia), 30, 47, 162,
 211, 280
 filipendulæ (Anthrocera), 37, 38, 44,
 106
 filipendulæ (Zygæna), 129, 323
 fimbria (Triphæna), 32, 127, 135, 159,
 180
 fingal (Brenthis), 67
 flava (Zygæna), 44, 323
 flavago (Gortyna), 267
 flavibasalis (Etholis), 249
 flavicornis (Asphalia), 137
 flavicornis (Polyplocia), 159, 183
 *flavilinea (Epilecta), 130
 *flavimacula (Phalera), 259
 flavofasciata (Abraxas), 349
 flavofasciata (Perizoma), 3, 161, 279
 *flavopuncta (Colias), 27
 flexula (Aventia), 30
 florentina (Ithysia), 318, 319, 321
 fluctuata (Larentia), 100
 fluctuata (Melanippe), 46, 80, 160
 fluctuata (Xanthorhœ), 80, 135
 fluviata (Camptogramma), 36, 230,
 300
 fluviata (Perenoptilota), 230
 fœnella (Epiblema), 75
 forficellus (Schœnobiis), 349
 formosa (Tirumala), 186
 *formosana (Alcis), 71

- fortunata* (*Epinephele*), 44
freijs (*Brenthis*), 25, 66, 187, 310, 340
frigga (*Brenthis*), 25, 66, 187
fritillum (*Hesperia*), 5
frugalis (*Memigis*), 249
fuciformis (*Hemaris*), 46, 153
fuciformis (*Macroglossa*), 84
fulgens (*Nepticula*), 101
fuliginosa (*Phragmatobia*), 31, 100
fuliginosa (*Spilosoma*), 291
fulva (*Tapinostola*), 30, 280, 292, 294
fulvago (*Citria*), 43
fulvana (*Eucosoma*), 39
fulvata (*Cidaria*), 279
fumata (*Acidalia*), 44, 45, 69, 157, 160, 185
furcata (*Hydriomene*), 44, 299
furcifera (*Xylina*), 11
furcula (*Cerura*), 80, 126, 129, 227
furva (*Mamestra*), 46
fusca (*Philosamia*), 46
fusca (*Phycis*), 349
fusca (*Pygmaea*), 100
fuscantaria (*Ennomos*), 32
fuscedinella (*Coleophora*), 349
fuscula (*Frastria*), 32, 153, 178
gædartaella (*Argyresthia*), 104
gæchtaria (*Eubolia*), 105
galactodactyla (*Acritilia*), 178
galatea (*Melanargia*), 44, 82, 126, 134, 158, 239, 240, 241, 301, 303, 304, 305, 306
galata (*Melanippe*), 319
galii (*Deilephila*), 231, 278, 300
gamma (*Plusia*), 31, 184, 227, 265, 343
gemina (*Apamea*), 179
geminipuncta (*Nonagra*), 32, 227
gemmana (*Rhyacionia*), 74, 75
gemmaria (*Boarmia*), 158, 284
geniculeus (*Crambus*), 30, 38, 295
geniste (*Mamestra*), 80
gentiana (*Penthina*), 38
geometroides (*Adrapsa*), 249
gerronella (*Brachmia*), 37
gerstæckeri (*Mimopacha*), 161
gilvago (*Mellina*), 43
glacialis (*Erebia*), 59, 346
glandifera (*Bryophila*), 31, 46
glareosa (*Noctua*), 159, 283
glauculalis (*Glyphodes*), 249
glyphica (*Euclidia*), 178
goante (*Erebia*), 134
Gonepteryx, 346
goniosigma (*Cirphis*), 132
gonostigma (*Orgyia*), 188
gordius (*Chrysophanus*), 303
gordius (*Loweia*), 60, 97
gorge (*Erebia*), 145
gorgon (*Epistor*), 40
gorgone (*Erebia*), 58, 60
gothica (*Tæniocampa*), 159, 230
gracilis (*Tæniocampa*), 135
gradiens (*Terias*), 139
græcaria (*Ithysia*), 315, 316, 317, 318, 319, 320, 321
graminea (*Hemithea*), 249
graminea (*Stellaria*), 347
graminis (*Charæas*), 31, 227, 280
grandipennis (*Butalis*), 38
granitella (*Acrolepia*), 38
graslini (*Luperina*), 43
grisea (*Stenosticta*), 308
grisea-typica (*Adactylus*), 38
griseata (*Lithostege*), 46
griseola (*Lithosia*), 204, 292
grossulariata (*Abraxas*), 43, 45, 105, 184, 187, 205, 232, 284, 299, 344, 349
**grosvenori* (*Acræa*), 41
grotiana (*Dichelia*), 227
gueneoi (*Luperina*), 43, 47, 102, 212
guttistriga (*Euproctis*), 249
guttulata (*Euproctis*), 249
halitherses (*Euripus*), 103
halteres (*Parnassius*), 284
hamula (*Drepana*), 31, 32, 153, 203
hamula (*Platypteryx*), 208
hartmanni (*Parnassius*), 284
harversoni (*Saturnia*), 212
hastana (*Rhyacionia*), 74, 75, 89, 90
hastata (*Eutype*), 161
hastata (*Larentia*), 100
hastiana (*Rhyacionia*), 74, 75
haworthi (*Celæna*), 30, 294
hazeleighensis (*Abraxas*), 349
hecabe (*Terias*), 248
hecate (*Amauris*), 186
hecla (*Colias*), 25, 309, 312, 315, 339, 340, 345, 349
hectus (*Hepialus*), 157
heldreichi (*Colias*), 339
helenæ (*Polyommatus*), 16
helenus (*Papilio*), 248, 298
helice (*Colias*), 231, 298, 299, 303, 348
heliconia (*Asota*), 249
hellmanni (*Tapinostola*), 104, 285, 286, 287
helvola (*Agrotis*), 281
heparata (*Euchæa*), 153
hepatica (*Xylophasia*), 159
hera (*Cænonympha*), 306
herbosana (*Dichrorampha*), 101
herbosana (*Hemimene*), 101
hermione (*Satyrus*), 133
Hesperia, 78
hesperides (*Anthocharis*), 323
hesperina (*Eudule*), 205
hexadactyla (*Orneodes*), 37
hexapterata (*Lobophora*), 136, 153
hiarbas (*Eurytela*), 163
hiera (*Pararge*), 62, 310
hilda (*CNeis*), 68
hilda (*Neorina*), 346
hippocoon (*Papilio*), 83, 162, 270, 271
hippolyte (*Hipparchia*), 78
hippotoë (*Chrysophanus*), 25, 29
hippotoë (*Heodes*), 345
hirtaria (*Biston*), 155, 156, 232, 233, 284

- hirtaria (Lycia), 135
 hispidaria (Apocheima), 80
 hispidaria (Nyssia), 137
 hispulla (Epinephele), 44
 hobleyi (Pseudacraea), 308
 hochenwarthi (Plusia), 69, 338
 holmiana (Acalla), 36, 37
 holmiana (Dictyopteryx), 37
 homerus (Papilio), 151
 honoratii (Thais), 45
 honorius (Epitola), 187
 honrathi (Tenaris), 347
 hortella (Lithocolletis), 42
 hospita (Nemeophila), 45, 350
 hospita (Parasema), 45, 185
 hostilis (Nephopteryx), 267
 hubnerella (Chilaria), 139
 humilis (Acraea), 83
 humuli (Hepialis), 227
 hyale (Colias), 16, 17, 35, 42, 44, 62,
 79, 80, 97, 106, 323
 hybridalis (Stenopteryx), 208
 hybridana (Sciaphila), 139
 Hydrocia, 102
 hylas (Polyommatus), 59, 97
 hyperanthus (Aphantopus), 279
 hyperanthus (Epinephele), 34
 hyperborea (Agrotis), 343
 hyperborea (Pachnobia), 338, 347
 hypericana (Catoptria), 178
 hypericella (Depressaria), 178
 hypermnestra (Hestia), 233
 hypoleucos (Hesperia), 7, 77, 78
 hypophlaeus (Chrysophanus), 65, 103,
 223, 340
 hypsea (Cethosia), 247
 ianira (Epinephele), 35, 95, 134, 279,
 299, 301, 343, 346
 ianthina (Triphaena), 31, 134, 159, 180,
 227, 228
 icarinus (Polyommatus), 348
 icarus (Lycæna), 157, 210, 227, 228, 233,
 268, 284, 297
 icarus (Polyommatus), 15, 17, 65, 97,
 103, 207, 348
 ichnusa (Aglais), 328
 ictericana (Tortrix), 38
 iduna (Melitæa), 25, 309
 ignicosta (Zamarada), 307
 ilicis (Strymon), 97
 imbutata (Carsia), 280
 imitaria (Acidalia), 47
 imitata (Pseudacraea), 307
 immaculata (Colias), 27
 immanata (Cidaria), 42, 45
 immutata (Acidalia), 292, 293, 294, 348
 impar (Bryophila), 46
 implicitana (Eupœcilia), 82
 implicitana (Phalonia), 82
 improba (Brenthis), 25
 impudens (Leucania), 46
 impura (Leucania), 179, 203, 204, 279,
 292
 inachis (Kallima), 248
 incanaria (Acidalia), 266, 267
 incanata (Acidalia), 33, 105
 incanata (Larentia), 100
 incarnatæna (Spilonota), 38
 incisa (Hermonassa), 131
 *inconstans (Hermonassa), 131
 incurcata (Larentia), 100
 indigens (Erebica), 145
 ines (Melanargia), 113
 inextricata (Silacida), 308
 infracta (Anaphe), 331
 inopiana (Idiographis), 37
 inquinatellus (Crambus), 38
 insolitalis (Nacoleia), 249
 *inspersa (Urapteryx), 168
 instabilis (Teniocampa), 159
 insularia (Pleuroprucha), 204
 interjecta (Triphaena), 37, 80, 135, 186,
 180, 228
 interrogationis (Plusia), 44, 45, 160, 211
 inuus (Hemeroplanes), 40
 io (Vanessa), 34, 35, 100, 101, 133, 184,
 266, 280, 297, 299, 305, 343
 iogani (Hestia), 139
 iota (Plusia), 32, 80, 211
 iphioides (Cœnonympha), 113, 306
 iris (Apatura), 35, 79, 103, 128, 129,
 231, 326, 348
 irregularis (Dianthœcia), 46
 *irrorata (Boralia), 147
 ismene (Melanitis), 247
 istrianus (Ithysia), 320, 321
 *italica (Ithysia), 315, 316, 317, 318,
 319, 320, 321
 itamputi (Papilio), 139
 Ithysia, 315, 316
 jacobææ (Euchelia), 37, 208, 299, 345
 japonica (Caligula), 46
 japygia (Melanargia), 113, 237, 304, 305
 jasionæta (Eupithecia), 31
 jasius (Charaxes), 305, 346
 juliana (Selenia), 292
 jurtina (Epinephele), 17, 44, 62
 jutta (Eneis), 67, 310
 karwinskii (Smyrna), 347
 kolga (Norasuma), 102
 lacertinaria (Drepana), 129
 lachesis (Melanargia), 113
 lacteella (Laverna), 344
 lacteella (Momphe), 344
 laticolor (Abraxas), 105
 lætana (Phoxopteryx), 135
 laglaizeri (Papilio), 234
 lambdella (Ecophora), 38
 lappona (Erebica), 58, 59, 66, 338, 345
 lapponica (Brenthis), 25, 66, 340
 lapponica (Colias), 27
 lapponica (Larentia), 100
 largetani (Obedia), 169
 laricella (Coleophora), 38
 laripennella (Coleophora), 37
 lathonia (Argynnis), 36, 305
 lathonia (Issoria), 62, 97
 *latifasciata (Glaucopteryx), 169

- laticornis* (*Tortrix*), 234
lavandulæ (*Zygæna*), 328
lavateræ (*Carcharodus*), 60, 96
lecheana (*Ptycholoma*), 306, 347
lefebvrei (*Erebina*), 58, 59
leighi (*Papilio*), 271, 324
lemolca (*Syntarucus*), 102, 162
lepida (*Discophora*), 347
leporina (*Acronycta*), 80
Leucania, 42
leucographa (*Teniocampa*), 159, 184
leuconoe (*Deilemora*), 186
leucophæa (*Pacetra*), 332
leucophæaria (*Hybernia*), 129, 155, 159, 232, 284
leucospila (*Doronaga*), 249
leucostigma (*Apanaea*), 44, 290, 292
levana (*Araschnia*), 35, 36, 45
libatrix (*Gonoptera*), 31, 208, 211, 228, 265
libatrix (*Scoliopteryx*), 136
lichenaria (*Boarmia*), 32
ligea (*Erebina*), 67, 134
lignata (*Phibalapteryx*), 349
ligula (*Orrhodia*), 80, 281
ligustri (*Sphinx*), 183, 238, 343
limacodes (*Cochlidion*), 129
limacodes (*Heterogenea*), 129
limitata (*Ortholitha*), 279
linea (*Hesperia*), 35, 203, 253, 254, 255, 256
linearia (*Zonosoma*), 3, 4, 43
lineola (*Adopana*), 96, 203
lineola (*Hesperia*), 251, 255
lineolata (*Hesperia*), 60
literana (*Leptogramma*), 43
literosa (*Miauna*), 32, 38, 227
lithargyria (*Leucania*), 31, 64, 136, 160, 179, 203, 326
lithodactyla (*Alucita*), 37, 38
lithoxylea (*Xylophasia*), 179
littoralis (*Sericoris*), 36, 38
littoralis (*Leucania*), 295
litura (*Amathes*), 266, 268, 281
liturata (*Semiothisa*), 80
liverana (*Tortrix*), 234
livornica (*Deilephila*), 100, 127, 209, 278
livornica (*Phryxus*), 42, 44, 100, 127, 183, 209, 278, 326
lobengula (*Amauris*), 331
leuwenhoekeella (*Pancallia*), 349
lofua (*Acraea*), 41
logæa (*Rhyacionia*), 73, 74
Lophoptera, 308
lota (*Amathes*), 80, 161, 281
lotella (*Anerastia*), 38, 203, 295
lotis (*Cupha*), 247
lowii (*Danisepta*), 139
lubricipeda (*Spilosoma*), 106
lucerna (*Agrotis*), 44, 159, 280
lucina (*Nemeobius*), 32, 84, 127, 136, 153, 185, 229, 349
lucipara (*Euplexia*), 31, 178
luctuosa (*Acontia*), 32
ludovicaria (*Lygris*), 170
lunaria (*Selenia*), 100, 160
lundana (*Phoxopteryx*), 135
lunosa (*Amathes*), 268
lunula (*Philosamia*), 46
luridata (*Tephrosia*), 349
lurlinus (*Papilio*), 44
lutarella (*Lithosia*), 279
lutea (*Abraaxas*), 349
lutea (*Leucania*), 62, 63, 203
luteago (*Dianthæcia*), 284, 348
luteata (*Asthena*), 135
lutescens (*Arctia*), 323
lutescens (*Zygæna*), 323
lutipennella (*Coleophora*), 349
lutosa (*Calania*), 265, 268
lutosa (*Nonagria*), 32
lutulenta (*Aporophyla*), 80
luzella (*Lampronia*), 36, 37
lycaon (*Epinephele*), 134
lychnitis (*Cucullia*), 32
lydius (*Ornithoptera*), 188
lynceus (*Hestia*), 233, 247
macarista (*Planema*), 307
machaon (*Papilio*), 9, 16, 17, 35, 36, 44, 97, 292, 303, 347, 348
macilenta (*Amathes*), 281
**macularia* (*Alcis*), 91
maculata (*Venilia*), 135, 157
maculea (*Lita*), 38
maculifera (*Panæthia*), 249
**maculosa* (*Arichanna*), 258
mæra (*Pararge*), 35, 62, 133, 283
malaya (*Megisba*), 248
malvæ (*Hesperia*), 5, 6, 77, 78, 154, 207, 310
malvella (*Gelechia*), 104
malvoides (*Hesperia*), 5, 6, 77, 78
manni (*Pieris*), 97
mannus (*Dicchoragia*), 248
manto (*Erebina*), 58, 59, 144, 145, 336
marcellus (*Papilio*), 44
margaritaria (*Eudalima*), 127
margaritaria (*Metrocampa*), 127, 157, 279
marginalis (*Ambia*), 249
marginalis (*Redoa*), 249
marginaria (*Hybernia*), 232
marginata (*Lomasipilis*), 136
marginipunctata (*Acidalia*), 31, 38, 178
marionalis (*Nacoleia*), 249
maritima (*Senta*), 203, 204, 227
marmorea (*Gelechia*), 37, 38
marmorinaria (*Hybernia*), 159, 284
marshallana (*Agrotis*), 104
marshalli (*Mimacraea*), 328
matura (*Cerigo*), 227, 228
maura (*Mania*), 42, 204, 265
medicicestra (*Thaïs*), 45
medon (*Aricia*), 61, 97, 207
medon (*Polyommatus*), 15, 17
medusa (*Erebina*), 335
megacephala (*Acronycta*), 179

- megæra (Pararge), 17, 30, 35, 62, 83,
 133, 136, 184, 207, 227, 232, 267, 268,
 229, 302
 megaspilaria (Alcis), 91
 megillalis (Dichocrocis), 249
 melaina (Parnassius), 284
 melaleuca (Anarta), 69
 melaleuca (Xylomiges), 105
 melampus (Erebia), 134, 158, 333
 melania (Tachyris), 39
 Melanitis, 247
 Melanocoma, 316
 melanopa (Anarta), 69
 meleager (Polyommatus), 57, 97
 melicerta (Neptis), 185
 melilotis (Zygæna), 129, 302
 Melitæa, 163
 melotis (Hesperia), 7, 77, 78
 mendica (Diaphora), 209
 menthastri (Spilosoma), 160
 menyanthidis (Acronycta), 45
 mercedonia (Tirumala), 186
 meridionalis (Zegris), 45
 mesomella (Cybonia), 32, 45
 metarete (Delias), 248
 metella (Neptis), 186
 *meticulosa (Phlogophora), 31, 33, 265,
 343
 *metrioscaphes (Zamarada), 199
 mi (Euclidia), 161, 178, 266, 349
 miata (Cidaria), 296
 micæa (Hydræcia), 31, 32, 227, 265,
 267
 microdactylus (Meioptilus), 292
 miegiu (Heodes), 61
 mimeticus (Papilio), 186
 minima (Lycæna), 253
 minimus (Cupido), 15, 61, 207
 ministrana (Rhyacionia), 74
 ministrana (Tortrix), 153
 minor (Agriades), 41
 minor (Anthocharis), 322, 323
 minor (Colias), 323
 minor (Pyrameis), 323
 minorata (Larentia), 100
 minutata (Coremia), 69
 misippus (Hypolimnas), 331
 mnemon (Erebia), 334
 mnemosyne (Parnassius), 58, 284
 modestalis (Herminia), 100
 mœstata (Larentia), 100
 monacha (Psilura), 35
 moneta (Plusia), 80, 101, 104, 181, 206,
 207, 302
 monodactylus (Pterophus), 30
 montana (Larentia), 100
 montana (Melanippe), 44
 moolata (Parnara), 248
 morgani (Tirumala), 186
 morpheus (Caradrina), 80, 179
 mucronellus (Schœnobius), 294, 349
 mulciber (Euplœa), 247
 multinealis (Sylepta), 249
 munda (Tœniocampa), 84, 128, 154, 159
 mundana (Nudaria), 46, 158
 munitata (Cidaria), 45
 munitata (Coremia), 279
 muralis (Bryophila), 32, 347
 muricata (Hyria), 210
 musciformis (Egeria), 348
 muscerda (Lithosia), 292, 293, 294
 musciformis (Sesia), 31
 muscula (Hylœsia), 46
 Mycalesis, 247
 mylitta (Antherea), 46
 myrtilli (Anarta), 325, 326
 nana (Dianthocia), 349
 nanatella (Depressaria), 38
 napi (Pieris), 34, 35, 44, 97, 105, 185,
 159, 202, 232, 265, 280, 310, 331, 338,
 346, 348
 nastes (Colias), 26, 39, 42, 122, 309, 389
 navalis (Glyphodes), 249
 nebritana (Endopsia), 178
 *nebulimargo (Zamarada), 197
 *nebulosa (Alcis), 91
 nebulosa (Aplecta), 32, 46, 127, 160
 nebulosa (Mamestra), 127
 nechus (Xylophanes), 40
 nefte (Athyma), 248
 neglectana (Hedya), 179
 nelamus (Erebia), 336
 nemetes (Neptis), 186
 neoridas (Erebia), 134
 nephelus (Papilio), 248
 neri (Chærocampa), 209
 neri (Daphnis), 209
 nero (Catophaga), 39
 nesimachus (Dichoragia), 248
 netunaria (Orthocraspeda), 181
 netunaria (Orthorissina), 181
 neurica (Nonagria), 290, 291, 292, 293,
 294, 295
 neustria (Malacosoma), 179, 297
 ni (Plusia), 44
 niavius (Amauris), 187
 nickerlin (Luperina), 43, 102
 nicomedes (Neptis), 186
 nictitans (Hydræcia), 102, 227, 281
 nigra (Abraxa), 344, 349
 nigra (Aporophyla), 138
 nigra (Boarmia), 94, 95, 96, 233
 nigra (Epunda), 281
 nigra (Gonodontis), 160
 nigra (Lamentis), 323
 nigra (Odontopera), 95
 nigrella (Elachista), 39
 nigrescens (Elymnias), 247
 nigrescens (Pieris), 322
 nigricans (Agrotis), 104, 203, 292, 301
 nigrifasciata (Arichanna), 73
 nigrilinearia (Ectropis), 70
 nigrina (Limenitis), 323
 nigripalparia (Luxiaria), 249
 nigripes (Nodaria), 249
 nigrocærulea (Abraxas), 349
 nigrocincta (Polia), 31
 nigrocrocea (Orgyia), 249

- nigrofasciaria (Anticlea), 160, 183
 *nigrofusa (Apophyga), 72
 nigromaculana (Cydia), 37, 38
 *nigronotata (Alcis), 71, 91
 *nigropallida (Boarmia), 94, 95, 96
 *nigropunctata (Archanaia), 148
 *nigropunctata (Colias), 340
 nigrosparsata (Abraaxas), 105, 344, 349
 niobe (Argynnis), 348
 nisella (Grapholitha), 292
 niveus (Acentropus), 349
 nivifera (Athyma), 248
 noctuella (Nomophila), 182
 norna (Eneis), 25, 68, 338
 notata (Macaria), 188
 notata (Semiolitha), 80
 nupta (Catocala), 32, 44, 227, 228, 266, 268, 300
 nyassinus (Papilio), 44
 Nyctalemon, 233
 nymphæa (Hydrocampa), 349
 nysiades (Neptis), 186
 obeliscata (Thera), 242, 243, 244, 245, 246
 obfuscaria (Dasydia), 45
 obfuscata (Gnophos), 388
 obliquisignæ (Alcis), 71
 obliterans (Ancara), 249
 obliterata (Euchæa), 153
 obliterata (Eupistertia), 295
 obliterata (Limenitis), 323
 obliterata (Thera), 244
 oblongata (Eupithecia), 34, 180
 obscura (Chrysophanus), 65
 obscura (Colias), 340
 obscura (Ithysia), 316, 321
 obscura (Pseudacraea), 307
 obscuraria (Pseudopanthera), 37, 38
 obscurata (Gnophos), 44, 160, 280
 obscurata (Pieris), 322
 obsoleta (Agriades), 44
 obsoleta (Asura), 218
 obsoleta (Colias), 323
 obsoleta (Ephyra), 187
 obsoleta (Epinephele), 279
 obsoleta (Erebia), 336
 obsoleta (Leucania), 178, 179
 *obsoleta (Eneis), 68
 occulta (Eurois), 314
 ocellaris (Daphnusa), 249
 ocellaris (Erebia), 322
 ocellaris (Mellima), 43
 ocellata (Mesoleuca), 299
 ocellata (Smerinthus), 31
 ochracella (Laverna), 38
 ochrata (Zamarada), 198
 ochrearia (Aspilates), 136, 295
 *ochreasuffusa (Colias), 340
 ochronigra (Boarmia), 95, 96
 octogesima (Cymatophora), 230
 octomaculata (Ennychia), 157
 *octoscripta (Obedia), 169
 ocellaris (Palimpsestis), 230
 oculatrix (Targallodes), 308
 ocella (Apamea), 203, 227, 228, 280
 ædipus (Cœnonympha), 306
 œme (Erebia), 333
 oleracea (Hadena), 33, 179, 297
 olivata (Larentia), 280
 onopordi (Hesperia), 137, 138
 oo (Dicycla), 230, 302
 operculella (Phthorimæa), 350
 ophiogramma (Apamea), 80, 292
 ophione (Neptidopsis), 186
 Oporabia, 162
 optilete (Polyommatus), 65, 340
 or (Cymatophora), 179
 or (Palimpsestis), 136, 179
 orbicularia (Zonosoma), 43
 orbiferana (Hemonia), 249
 orbitulus (Latiiorina), 309, 314
 orbona (Triphæna), 33, 135, 268
 orestia (Acraea), 83
 orion (Scolitantides), 306
 ornata (Acidalia), 349
 ornithopus (Graptolitha), 343
 ornithopus (Xylina), 84
 Orthocraspeda, 181
 Orthorisma, 181
 Orthotænia, 74
 osiris (Cupido), 97
 ossianus (Brenthis), 25, 65, 66
 ovulata (Eustroma), 2, 3
 oxyacanthæ (Miselia), 80, 281
 pactolinus (Callioratus), 331
 Pæctes, 308
 prænalis (Nacoleia), 249
 palæmon (Carterocephalus), 84, 154
 palæno (Colias), 27, 42, 345
 palawanicus (Papilio), 248
 paleacea (Cosmia), 344
 pales (Brenthis), 25, 62, 66, 337, 340, 345, 348
 palleana (Tortrix), 157
 pallens (Leucania), 31, 33, 37, 42, 62, 63, 101, 102, 108, 179, 203, 228, 232, 265, 266, 267, 268, 297
 pallescens (Colias), 323
 pallescentella (Tinea), 139
 pallida (Brenthis), 66
 *pallida (Colias), 27, 323
 *pallida (Eneis), 68
 pallida (Scoparia), 230
 pallidice (Colias), 323
 *pallidior (Colias), 323
 pallidula (Graphiphora), 132
 pallidula (Hermonassa), 132
 palpina (Pterostoma), 160
 paludata (Carsia), 46
 paludella (Schœnobiæ), 294
 paludis (Hydræcia), 32
 paludis (Hydrilla), 203, 204, 227, 228, 265, 267
 pamphilus (Cœnonympha), 31, 35, 62, 134, 136, 207, 208, 210, 306, 310
 pandamalis (Dichocrocis), 249
 paniscus (Carterocephalus), 154
 pantoni (Chlosyne), 150

- paphia (Argynnis), 31, 35, 128, 202, 232, 299, 301
 paphia (Dryas), 97, 187
 papilionaria (Geometra), 45, 80, 280
 paradisea (Ornithoptera), 234
 paradoxus (Papilio), 233
 paragea (Planema), 307
 pardalaria (Pantherodes), 205
 parentheses (Sophronia), 139
 parthenias (Brepheos), 181, 208
 parthenie (Melitea), 62, 133
 pastinum (Toxocampa), 32
 paulina (Catophaga), 39
 pavonia (Saturnia), 46, 47, 160
 *pearsoni (Saturnia), 47
 pectimataria (Larentia), 157
 pedaria (Phigalia), 80, 100, 137, 155, 159
 pelaus (Papilio), 151
 peltigera (Heliopsis), 183
 Pencillaria, 308
 pendularia (Ephyra), 44, 129, 232
 penkleriana (Grapholitha), 292
 periphanes (Acræa), 41
 perla (Bryophila), 31, 347
 perlellus (Crambus), 37
 permixtana (Lobesia), 101
 petraria (Lozogramma), 135, 159, 160
 petrificata (Xylina), 43
 phalantha (Atella), 19
 Phalga, 308
 pharte (Erebia), 145
 pheretes (Albulina), 162, 330
 pheretes (Lycæna), 330
 phicomone (Colias), 323
 philanthiformis (Sesia), 31
 philodice (Colias), 323
 phlæas (Chrysophanus), 30, 35, 65, 128, 161, 207, 208, 227, 228, 266, 267, 268, 296, 297, 323
 phlæas (Rumicia), 42, 43, 44, 61, 97, 103, 104, 105, 232, 310, 340, 348
 phœbe (Melitea), 16, 17, 133, 303
 phorbis (Pholus), 40
 phorcas (Papilio), 346
 phragmitellus (Chilo), 180, 203, 290, 291
 phragmitidis (Calamnia), 204, 290, 291, 292, 294
 pictella (Argyritis), 44
 pilosa (Docheophora), 205
 pilosaria (Phigalia), 136, 137
 pinellus (Crambus), 295
 pinetellus (Crambus), 179
 pinitaria (Bupalus), 43, 229, 322
 piniperda (Panolis), 159, 183
 pinivorana (Retinia), 155
 pisi (Hadena), 153, 160, 297
 pistacina (Amathes), 267, 268, 343
 pistacina (Anchocelis), 104
 pitho (Erebia), 145
 plagiata (Anatis), 280
 plagiata (Ilema), 248
 plana (Catophaga), 248
 Planema, 270, 331
 planemoides (Planema), 274
 plantaginis (Nemeophila), 30, 32, 45, 178, 350
 plantaginis (Parasemia), 45, 154, 157, 178, 185
 planta (Lycænopsis), 248
 plebeia (Alcis), 70
 plecta (Noctua), 31, 33, 179, 265
 pleione (Teracolus), 330
 plexippus (Anosia), 146
 plusioides (Eleale), 308
 podalirius (Iphiclidus), 97
 podalirius (Papilio), 303, 305
 podana (Tortrix), 41, 267
 Pœcilopsis, 316
 polaris (Aglas), 65, 340
 polaris (Brenthis), 25, 187, 309
 olata (Larentia), 100
 politella (Gelechia), 37
 polixenes (Papilio), 44
 pollux (Brenthis), 67
 polychloros (Eugonia), 133
 polychloros (Vanessa), 225, 227, 297, 305
 polycommata (Lobophora), 159
 polydactylus (Orneodes), 37
 polyodon (Xylophasia), 180, 203, 265
 polyxena (Thais), 282
 popularis (Epineuron), 265, 280
 popularis (Neuron), 31
 populata (Cidaria), 45
 populata (Lygus), 100, 160, 279
 populeti (Toxocampa), 80, 154
 populi (Amorpha), 42, 43
 populi (Smerinthus), 47, 136, 160, 211, 297
 porcellus (Chærocampa), 32, 211
 porphyrea (Hadena), 187
 porina (Araschnia), 45
 posthumus (Epitola), 187
 posticana (Iletinia), 295
 potatoria (Cosmotriche), 46, 136
 povelii (Colias), 323
 prasina (Eurois), 159
 priamus (Ornithoptera), 234
 prieuri (Satyrus), 113
 primulæ (Agrotis), 100
 princetonia (Neophasia), 323
 proboscidalis (Hypena), 136, 178, 180, 268
 procellata (Melanthia), 178
 procida (Melanargia), 82, 305
 prodromaria (Amphidasys), 208
 progemma (Hybernia), 137, 208
 promissa (Catocala), 128
 promutata (Acidalia), 31
 pronoe (Erebia), 145
 pronuba (Triphæna), 33, 126, 179, 228, 265, 267, 280, 281
 pronubana (Tortrix), 326
 propugnata (Coremia), 157
 prorsu (Araschnia), 36, 45
 prosapiaria (Ellopiæ), 32
 protea (Eumichtia), 128
 protea (Hadena), 267, 281

- provincialis (Melitea), 133
 pruinata (Pseudoterpna), 136, 180
 prunaria (Angerona), 44, 79
 prunata (Cidaria), 158
 pruni (Thecla), 154
 pruniana (Penthina), 208
 Pseudacræa, 330, 331
 pseudargiolus (Celastrina), 345, 349
 pseudomas (Colias), 323
 psi (Acronycta), 33, 179
 psytalea (Amauris), 102, 186
 pudens (Chionama), 248
 pudibunda (Dasychira), 153, 266, 267
 pudicaria (Bronchela), 205
 pudorina (Leucania), 32
 puella (Neptis), 186
 pulchellata (Eupithecia), 36
 pulcherrima (Ripogenus), 308
 *pulchra (Daseocheta), 132
 pulchrina (Plusia), 32, 80, 158, 211
 *pulveraria (Ectropis), 91
 pulveraria (Numeria), 135, 136, 153
 pulveratella (Aristoteia), 344
 pulveratella (Doryphora), 344
 pumilata (Eupithecia), 34, 135, 203, 228
 punctalis (Stenia), 37
 punctaria (Zonosoma), 3
 punctifera (Agriades), 348
 punctilinea (Archana), 148
 punctivenaria (Gnophos), 73
 punctularia (Tephrosia), 157, 183
 purdeyi (Retinia), 73, 327
 purdeyi (Rhyacionia), 73, 327
 *purimargo (Zamarada), 197, 199
 purpuralis (Pyrausta), 30, 157, 208, 349
 purpurea (Depressaria), 37
 purpurescens (Colias), 323
 pustulata (Phorodesma), 32
 puta (Agrotis), 33, 46, 127, 208, 230, 267, 268
 putridella (Depressaria), 44, 137
 putris (Axyia), 31, 179
 pygmæella (Argyresthia), 139
 pygmæella (Lithosia), 279, 290
 pyraliata (Cidaria), 157, 279
 pyralina (Calymnia), 157, 184
 pyralina (Cosmia), 157
 pyramidea (Amphipyra), 227, 228
 pyrenaica (Colias), 323
 pyrenaica (Erebica), 58
 pyrenaica (Hesperia), 78
 pyrenaica (Polyommatus), 57, 59, 60
 pyrenaicus (Hepialus), 345
 pyretorum (Saturnia), 47, 196
 pyri (Saturnia), 347
 pyrocincta (Zamarada), 197
 pyrrha (Erebica), 336
 pyrrhula (Erebica), 145, 336
 quadra (Cnectra), 302
 quadrifasciata (Flammona), 249
 quadrilineata (Bocla), 249
 quadripuncta (Ecogenia), 37, 38
 quadripuncta (Symoca), 37, 38
 quadripunctata (Caradrina), 28
 quercifolia (Gastropacha), 182
 quercifoliella (Lithocolletis), 349
 quercinaria (Ennomos), 349
 quercus (Bombyx), 231
 quercus (Bithys), 42
 quercus (Lasiocampa), 36, 37, 78, 79, 135, 297, 299
 quercus (Thecla), 180, 185
 quercus (Zephyrus), 35, 97
 quintella (Neptis), 186
 radiata (Phlæas), 348
 radiata (Spilosoma), 106, 323
 radiella (Fumea), 135
 radiosa (Agriades), 15, 17
 ramella (Grapholitha), 293
 rantaizanensis (Paradarisa), 258
 rapæ (Pieris), 30, 34, 62, 97, 105, 135, 159, 343
 *rectifascia (Vindusara), 259
 regulata (Macraea), 205
 reliquana (Lobesia), 101
 remutata (Acidalia), 136
 repandata (Boarmia), 32, 43, 45, 46, 94, 127, 129, 135, 157, 160, 233, 349
 resinaria (Thera), 244
 reticulata (Cidaria), 350
 reticulata (Eustroma), 1, 2, 85, 88, 89, 277
 reticulata (Neuria), 349
 Retinia, 73, 74, 75, 89, 295
 retusa (Platenis), 80
 revayana (Sarothripus), 308
 rex (Papilio), 186
 rhamni (Gonepteryx), 17, 34, 35, 44, 97, 128, 158, 280, 329
 rhediella (Pyrodes), 36
 rhodopensis (Erebica), 335
 rhoio (Melitea), 133
 rhomboidaria (Boarmia), 204, 268
 Rhyacionia, 73, 74, 75, 89, 90
 ribeata (Thera), 245
 ridens (Polyplocia), 154
 ripæ (Agrotis), 179, 180
 Ripogenus, 308
 rippertii (Polyommatus), 97
 roborana (Notocelia), 37
 roboraria (Alcis), 71
 roboraria (Boarmia), 45, 46, 80, 84, 129
 robsoni (Aplecta), 46
 robustalis (Simplicia), 249
 rogersi (Pseudacræa), 307
 rondoui (Polyommatus), 61
 rosa (Colias), 323
 roscidaria (Fidonia), 100
 rosea (Agrotis), 349
 *rosea (Colias), 323, 339
 roseana (Phalonia), 38
 *rossica (Ithysia), 316, 321
 rotundipennis (Nishada), 248
 ruberata (Hydromene), 161
 rubi (Callophrys), 65, 156, 207, 208, 281
 rubi (Macrothylacia), 185

- rubi (*Noctua*), 33, 153, 227, 294, 297
 rubi (*Thecla*), 32, 156
 rubicilia (*Agrotis*), 129
 rubidata (*Anticlea*), 188
 rubiginata (*Acidalia*), 46
 rubiginea (*Dasycompa*), 183, 184
 rubicollis (*Gnophria*), 84
 rubricosa (*Tæniocampa*), 159
 rubricosta (*Mitochrista*), 249
 rufa (*Cænobia*), 46, 291, 295
 rufa (*Leucania*), 63, 203
 rufina (*Amathes*), 288, 296
 rumicis (*Acronycta*), 33, 159, 228, 267
 rumina (*Thais*), 45
 rupicaparra (*Hybernia*), 159
 rupicola (*Phalonia*), 37, 38
 ruralis (*Notarcha*), 37
 rurca (*Xylophasia*), 38, 159
 russata (*Cidaria*), 41
 russula (*Diacrissia*), 42, 45
 russula (*Nemophila*), 84
 *rusticaria (*Alcis*), 91
 rusticellaria (*Monopis*), 104
 rutilus (*Chrysophanus*), 103, 156
 saba (*Glutophrissa*), 161
 saclava (*Neptis*), 186
 sacraria (*Sterrha*), 42, 44
 salicata (*Melanodyris*), 159, 161
 salicis (*Acronycta*), 159
 salictella (*Marmara*), 102
 salinellus (*Crambus*), 180
 salmoni (*Caligula*), 46
 sangana (*Phalera*), 249
 sanio (*Diacrissia*), 42, 45, 46, 185, 210
 sao (*Pyrgus*), 16, 59, 96
 saponaria (*Neuronia*), 32
 sari (*Terias*), 248
 Sarothripus, 308
 satellitia (*Eupsilia*), 80, 281
 satellitia (*Scopelosoma*), 296
 satura (*Hadena*), 187
 saturnus (*Papilio*), 248
 satyrata (*Eupithecia*), 349
 saucia (*Agrotis*), 31, 265, 343
 scabriuscula (*Dipterygia*), 228, 279
 schaldualis (*Simplicia*), 249
 schalleriana (*Peronea*), 30
 schmidtii (*Rumiccia*), 42, 43, 44, 103, 104
 schultziiana (*Mixodia*), 139
 schultziiana (*Rhyacionia*), 75
 scipio (*Erebia*), 96, 134
 scolopacina (*Xylophasia*), 184
 scopoliana (*Catoptria*), 39
 scopoliana (*Eucosma*), 39
 sebrus (*Cupido*), 97
 segetum (*Agrotis*), 31, 33, 265, 281, 296
 selasellus (*Crambus*), 294
 selene (*Actias*), 46
 selene (*Argynnis*), 46, 79, 80, 84, 153, 185, 260
 selene (*Brenthis*), 42, 43, 346
 selene (*Tenaris*), 347
 semele (*Hipparchia*), 17, 44, 103, 184
 semele (*Satyrus*), 30, 35, 36, 83, 160, 348
 semialba (*Alcis*), 72
 semiarcurata (*Polyommatus*), 348
 semiargus (*Cyaniris*), 36, 97
 semiargus (*Nomiades*), 15, 16, 61
 semibrunnea (*Lithoplanes*), 80
 semibrunnea (*Xylina*), 32, 43
 semiclarata (*Alcis*), 91
 semifuscana (*Pædisca*), 292, 294
 semisynggrapha (*Agriades*), 44, 347, 349
 senex (*Comacla*), 32, 180
 senex (*Nudaria*), 180, 293, 294
 senicionis (*Homæosoma*), 267
 separata (*Boarmia*), 249
 serena (*Hecatera*), 32
 serratulæ (*Hesperia*), 59
 Sesia, 43
 shepherdana (*Peronea*), 292, 294
 sibylla (*Limenitis*), 127, 135, 136, 202, 231, 267
 siculana (*Phoxopteryx*), 292
 silaceata (*Cidaria*), 30
 silaceata (*Eustroma*), 160, 183
 Silacida, 308
 silenusalis (*Bocana*), 249
 silvatica (*Antherea*), 46
 sumilis (*Lymantria*), 249
 similis (*Porthesia*), 44, 47, 126, 227, 297
 simla (*Caligula*), 46
 simpliciana (*Dichrorampha*), 38
 simphonisa (*Anthocharis*), 61
 sinapis (*Leptosia*), 35, 62, 97, 187, 232, 301
 sinapis (*Leucophasia*), 126, 158, 188, 310, 349
 sinuella (*Homæosoma*), 38
 *sinuosa (*Hermonassa*), 131
 sinuosa (*Phalga*), 308
 snelleni (*Zobia*), 308
 socia (*Lithophane*), 128, 343
 socia (*Xylina*), 43, 84
 solidaginis (*Calocampa*), 280
 solidaginis (*Lithomia*), 210
 sorbi (*Lithocolletus*), 101
 sordaria (*Gnophos*), 100, 338
 sordida (*Mamestra*), 32, 179
 sordidata (*Hydriomene*), 44
 sordidata (*Hypsipetes*), 42
 spadicearia (*Iarentia*), 100
 sparganiella (*Orthotelia*), 227
 spartata (*Chesias*), 136, 296
 speciosa (*Agrotis*), 100
 spilodactyla (*Wheeleria*), 44
 spini (*Strymon*), 61, 97
 spiniella (*Argyresthia*), 38
 spinula (*Cilia*), 208, 280
 sponsa (*Catocala*), 128
 sponsana (*Peronea*), 30
 squammigera (*Lophoptera*), 308
 stabilis (*Tæniocampa*), 159
 stachydalis (*Pyrausta*), 37
 stagnata (*Hydrocampa*), 332, 349

- statices* (Procris), 349
statilinus (Hipparchia), 134
staudingeri (Anarta), 100
steiberi (Chrysophanus), 25
stellata (Perigea), 133
stellatarum (Macroglossa), 19, 182, 183, 229, 230, 267, 299, 347
Stenosticta, 308
stettinensis (Lithocolletis), 42
sthenno (Erebia), 58
Stictoptera, 308
stigmatica (Noctua), 228
stragulata (Thera), 244
straminealis (Orobena), 295
straminata (Acidalia), 127
straminea (Conchylis), 258
straminea (Leucania), 31, 46, 64, 153, 154, 203, 201, 290, 292
straminicola (Lithosia), 292
strataria (Amphidasys), 187
stratiolata (Paraponyx), 349
striata (Agriades), 41
strigilis (Miana), 179
strigillaria (Perconia), 45, 185
strigula (Agrotis), 128
strigula (Nola), 127
strigulata (Diacrissa), 249
stringipennis (Asura), 248
stygue (Erebia), 58, 134, 163
suasa (Hadena), 32, 33, 178
**subalba* (Eucherodes), 169
subalbida (Epinephele), 323
**subdecora* (Cirphis), 147
subfulvata (Eupithecia), 42, 348
**subfusca* (Trachea), 260
subhastata (Larentia), 100
sublustris (Xylophasia), 46
subnigrella (Elachista), 39
subnotata (Eupithecia), 180
subornata (Chionoma), 218
subpropinquella (Depressaria), 30, 38
subpurpurea (Trigonophora), 148
subroseata (Ephyra), 232
subsericeata (Acidalia), 79
substriata (Agrotis), 349
subtusa (Platenis), 80
succulenta (Erebia), 310
suffumata (Cidaria), 157
suffumata (Lampropteryx), 159, 160
suffusa (Agrotis), 31, 265, 267, 268, 343
suffusa (Conistra), 281
suffusa (Xylina), 41
sulitelma (Colias), 25, 339
sulphuralis (Emmelesia), 46
sulphurea (Colias), 27
sulphurea (Pieris), 26
**suppressa* (Colias), 339
supracerulea (Polyommatus), 15
suradeva (Vitessa), 249
suwarovius (Melanargia), 237, 239, 240, 241
swynnertoni (Neptis), 186
sylvanus (Augiades), 96, 207, 210
sylvanus (Hesperia), 35
sylvata (Hydrelia), 32
sylvella (Lithocolletis), 42
sylvestrana (Retinia), 295
sylvestrana (Rhyacionia), 74
sylvia (Parthenos), 248
syngrapha (Agriades), 15
syacusana (Melanargia), 82, 303
syringaria (Hygrochroa), 47, 127, 128
syringaria (Pericallia), 32, 136
syringella (Gracillaria), 41, 104
tedella (Coccyx), 154
tæniata (Emmelesia), 32
tages (Nisoniades), 16, 96
tages (Thanaos), 154, 161, 207
**taiwana* (Cirphis), 132
**taiwana* (Gnophos), 73
**taiwana* (Pachyodes), 259
talaca (Hyposidra), 249
tanacetii (Dichrorampha), 101
tanacetii (Hemimene), 101
Targallodes, 308
tedella (Evetria), 75
telicanus (Lampides), 97
tellesalis (Piletocera), 249
tellus (Planema), 307
telphusalis (Bocchoris), 249
temerata (Bapta), 127, 160, 349
templi (Dasypolia), 159, 234, 326, 352
tenebrella (Aristotelia), 36
tenebrella (Monochroa), 36
tenebrosa (Rusina), 31
tentacularia (Herminia), 100
tenuiata (Eupithecia), 292
tephradactyla (Leioptilus), 233
terra (Pseudacris), 307
terrella (Bryotropha), 30
testacea (Luperina), 31, 43, 265
testata (Cidaria), 280
testudo (Limaecodes), 78, 107
tetralunaria (Selenia), 183
thauamas (Adopæa), 200
Thera, 241
thetis (Agriades), 14, 15, 17, 59, 97, 348
thore (Brenthis), 66, 67
thules (Emmelesia), 106
tilaha (Terias), 139
tileicles (Papilio), 233
tilie (Mimas), 44
tiliaria (Ennomos), 267
tincta (Aplecta), 45
tiphon (Cænonympha), 45, 306, 307
tithonus (Agriades), 15, 17
tithonus (Epinephele), 16, 17, 30, 31, 134, 180, 299, 323
tityrus (Hemaris), 310
**torneoensis* (Colias), 27
tortricoides (Ilema), 248
trabealis (Emmelesia), 46
tragopogonis (Amphipyra), 265, 281
trajanus (Erebia), 145
transitelea (Deilemera), 186

- translucida (Zamarada), 198, 200, 249
 transvisaria (Zamarada), 199, 200
 trapezina (Calymnia), 227
 tremula (Pheosia), 80, 160, 211
 trepida (Notodonta), 31, 80, 160, 183
 triangulum (Noctua), 135, 159
 tridens (Acronycta), 179
 trifenestrata (Oricula), 284
 trifolii (Anthrocea), 104
 trifolii (Hadena), 180
 trifolii (Pachygastria), 348
 trifolii (Zygæna), 209
 trigeminana (Ephippiphora), 37
 trigemina (Epiblema), 36, 37
 trigeminella (Coleophora), 328
 *trilireata (Pictopis), 70
 tringipenella (Gracillaria), 37
 tripartita (Abrostola), 32
 triplasia (Abrostola), 158
 tristellus (Crambus), 31, 38
 tritici (Agrostis), 37, 203, 292, 295
 Trochilum, 44
 trophonius (Papilio), 271, 324
 truncata (Cidarina), 44, 228, 280
 turbaria (Larentia), 100
 turca (Leucania), 302
 turcica (Melanargia), 304
 turionana (Rhyacionia), 74
 turpisaria (Luxiaria), 249
 turritis (Anthochloris), 323
 tyndarus (Erebia), 58, 134
 typhæ (Nonagria), 46, 291
 typhon (Cænonympha), 45, 46, 137,
 160, 161, 185, 210
 typica (Mania), 179
 ulcetana (Catoptria), 38, 135, 322
 uliginosellus (Crambus), 38
 ulmana (Rhyacionia), 75
 ulvæ (Senta), 203
 umbratica (Cucullia), 20, 32, 46, 211
 umbrosa (Noctua), 228, 280
 unangulata (Hydriomene), 37
 unanimis (Apamea), 159
 undulata (Eucosmia), 159
 undulataria (Luxiaria), 249
 unguicula (Drepana), 32
 unicolor (Erebia), 310
 unidentaria (Coremia), 34, 135, 203,
 280
 unifascia (Thalera), 249
 unifasciana (Tortrix), 30
 uniformeola (Asura), 249
 unimaculella (Micropteryx), 349
 unipuncta (Leucania), 326
 *unipupillata (Cneis), 68
 urticæ (Aglais), 17, 61, 65, 328, 340
 urticæ (Spilosoma), 209, 323
 urticæ (Vanessa), 30, 31, 35, 184, 226,
 228, 281, 297, 343
 vaccinii (Conistra), 281, 266
 vaccinii (Orrhodia), 80
 vagigutta (Eugoa), 249
 valezina (Argynnis), 128
 vanadis (Zygæna), 69
 varia (Chrysopsycha), 331
 varia (Melitæa), 163, 345
 variata (Thera), 241, 242, 243, 244, 245,
 246
 variegana (Peronea), 30, 38, 43
 varipes (Carex), 308
 varleyata (Abraxas), 105, 34
 venatus (Pinacopteryx), 328
 venetia (Peratophyga), 249
 venustula (Erastria), 39
 verbasci (Cucullia), 233
 vernacularia (Pomasia), 249
 vernaria (Geometra), 32
 vernetensis (Melitæa), 62
 versicolor (Endromis), 29
 verticalis (Spilodes), 203
 vestigialis (Agrotis), 266, 295
 vetusta (Calocampa), 265, 281
 viburniana (Tortrix), 180, 204
 vicaria (Ilema), 248
 vidura (Dacalana), 248
 villica (Arctia), 32, 230
 viminalis (Bombycia), 46
 vinula (Dicranura), 135, 346
 viretata (Lobophora), 32, 44, 183,
 294
 virgata (Agrotis), 349
 *virgata (Alcis), 90
 virgata (Melitæa), 232
 virgata (Mesotype), 46
 virgaureæ (Heodes), 60, 96
 virgaureata (Eupithecia), 31
 virgo (Hestia), 139
 virgularia (Acidalia), 42, 103
 viridaria (Prothymnia), 185
 viridisquama (Aquis), 249
 vitiosata (Thera), 244
 vittata (Cænocalpe), 279
 vittata (Phibalapteryx), 292, 293,
 294
 vittella (Cerostoma), 38
 vittellina (Leucania), 63
 vosgesiacæ (Erebia), 145
 vulpina (Zamarada), 197
 walkeri (Amphimæa), 40
 walkeri (Craspedia), 249
 waterstradti (Tagiades), 218
 werdandi (Colias), 26, 39, 42, 122, 125,
 309
 whytei (Amauris), 331
 wiskotti (Colias), 323
 xanthographa (Noctua), 228, 232, 265,
 266, 267, 280
 xanthomista (Polia), 44
 xerampelina (Cirrhiædia), 160
 ypsilon (Amathes), 281
 Ypthima, 247
 zalmora (Neopithecopis), 248
 Zamarada, 196
 zancleus (Papilio), 305
 zebra (Lampides), 248
 ziczac (Notodonta), 129, 160, 267, 280,
 295
 zitenus (Melanitis), 247

Zobia, 308
zoegana (*Euxanthis*), 37
zoegana (*Xanthosetia*), 37

zollikoferi (*Xylophasia*), 108
zonaria (*Ithysia*), 315, 316, 320, 321
zonaria (*Nyssia*), 232, 349

Order XIX. COLEOPTERA.

abbreviata (*Diaprepes*), 272
Amara, 46
analis (*Heptadonta*), 250
analis (*Odontachila*), 250
Anchomenus, 46
andouini (*Oxyntopterus*), 83
annulipes (*Apion*), 341
arietis (*Clytus*), 42, 347
asellus (*Cardiophorus*), 189, 190
aurulenta (*Cicindela*), 250
Bembidium, 46, 341
bipustulatus (*Chilocorus*), 82
bowringi (*Poteriophorus*), 252
brunnea (*Microrhiza*), 41
Carabus, 107
Cardiophorus, 189
catenulatus (*Carabus*), 44
Cebrio, 331
celia (*Glenia*), 250
cercus (*Dischissus*), 250
Chalæus sp., 252
clavicornis (*Mycetopus*), 83
coarctatum (*Actidium*), 99
Coccinella, 41, 46
corruscus (*Philonthus*), 83
cyaneus (*Ocypus*), 41
Cybister, 46
discipennis (*Aleochara*), 40
donisthorpei (*Philonthus*), 83
Eleodes, 351
elytoides (*Daphisia*), 83
fairmairei (*Eryx*), 102
fastuosa (*Cassida*), 347
fimbriata (*Leptoderma*), 250
formicetorum (*Stenus*), 83
fornicata (*Pimelia*), 44
forticornis (*Mycetopus*), 83
fucicola (*Actinopteryx*), 99
fuscipes (*Pæderus*), 341
galloprovincialis (*Monochamus*), 205
gigas (*Cebrio*), 331, 348
glauca (*Entelopes*), 250
Harpalus, 46
heydeni (*Halipus*), 42
Hister, 46
huttoni (*Pentarthrum*), 347
Hydrous, 46
immaculata (*Halipus*), 42
intermedius (*Philonthus*), 83
Lesticus sp., 252
linearis (*Hypophæus*), 83
longicornis (*Claviger*), 186
luctuosa (*Lestiva*), 39

lunatus (*Diphyllus*), 4
lundii (*Euryphagus*), 250
luteola (*Psylliodes*), 344
märkeli (*Triarthron*), 40
marginalis (*Dytiscus*), 42
melanocephala (*Microrhiza*), 41
melanocephalus (*Longitarsus*), 40
melanura (*Pterolophia*), 252
micans (*Orchesia*), 5
montivagus (*Catops*), 162
morio (*Stenus*), 83
moschata (*Aromia*), 42
Nabis, 341
nigroguttata (*Mysia*), 187
nomax (*Halipus*), 232
nucleorum (*Caryoborus*), 348
nuctuorum (*Caryoborus*), 42
obliterata (*Adalia*), 344
oblongoguttata (*Mysia*), 187
obsoletus (*Carpophilus*), 161
o'connori (*Phædrophilus*), 82
pallidus (*Luciola*), 250
pallidum (*Lathrobium*), 344
pedestris (*Xylotrechus*), 250
plumosa (*Himantocera*), 250
Pterolophia sp., 252
Pterostichus, 46
puella (*Philonthus*), 347
pustulata (*Glenia*), 252
pyrosticta (*Chrysodema*), 250
quadraticollis (*Traonetha*), 250
quadripustulatum (*Bembidium*), 83
rufipes (*Cardiophorus*), 190
sarawacensis (*Aspidomorpha*), 250
scenicus (*Xylotrechus*), 250
serratus (*Henoticus*), 348
sexdecimpunctata (*Micraspis*), 342
sempustulatus (*Carpophilus*), 161
silacea (*Aspidomorpha*), 40
stellatus (*Polriophorus*), 250
stipes (*Gabrus*), 42
sublineata (*Adalia*), 344
sutor (*Monochamus*), 205
sylvatica (*Cicindela*), 42
testaceus (*Claviger*), 186
tredecimguttata (*Laccoptera*), 250
tristis (*Catops*), 162
undecimpunctata (*Coccinella*), 342
undeviginta-punctata (*Coccinella*), 341
vittatus (*Orthogonius*), 250
vittatus (*Peltonotus*), 252
wehnkei (*Halipus*), 347

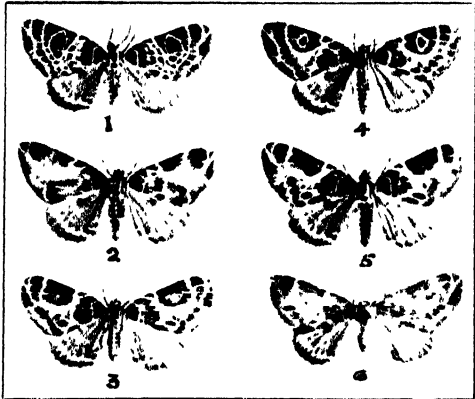
Order XXI. DIPTERA.

(including (6) *Siphonaptera*.)

- Aedes*, 192, 193, 260
affinis (*Culex*), 277
albopunctatus (*Culex*), 220
annulata (*Theobaldia*), 192, 261, 262, 264, 277
annulatus (*Culex*), 262
annulipes (*Ochlerotatus*), 192, 194, 217, 218
Anopheles, 98, 192, 193
apicotæniata (*Uranotænia*), 93
arcanus (*Culex*), 218
auricincta (*Erephopsis*), 47
austeni (*Glossina*), 350
barberi (*Anopheles*), 193
bicolor (*Brachyopoda*), 306
bicolor (*Culex*), 264, 277
bifurcatus (*Anopheles*), 193
**caballa* (*Grabhamia*), 93
caliginea (*Glossina*), 331
calopus (*Culex*), 263
cantans (*Ochlerotatus*), 192, 218, 261
cimiciformis (*Discomyza*), 342
cinereus (*Aedes*), 192, 260, 261, 263, 264
concinus (*Culex*), 220, 277
conitus (*Xanthandrus*), 232
Culex, 192, 163, 194, 263, 286
Culicella, 286
Dacus, 162
detritus (*Ochlerotatus*), 220
Discomyza, 342
diversus (*Ochlerotatus*), 192, 194, 219, 264, 277
doliorum (*Culex*), 263
domesticus (*Culex*), 263
dorsalis (*Ochlerotatus*), 192, 194, 261
equestris (*Merodon*), 139
ficalbii (*Culex*), 262
flavescens (*Culex*), 218
flavirostris (*Culex*), 277
fumipennis (*Culex*), 218, 263, 277, 286
fuscus (*Culex*), 220
Glossina, 29, 331
gossypii (*Contarinia*), 273
grossa (*Glossina*), 47
guttatus (*Culex*), 220
hiemalis (*Boreas*), 42
Hyperechia, 330
lateralis (*Ochlerotatus*), 192, 194, 218, 220, 277
**lineata* (*Pseudohowardina*), 92
lineola (*Syrphus*), 43, 82
ludlowi (*Anopheles*), 98
luteovittatus (*Culex*), 219
lutescens (*Culex*), 263, 277
maculatus (*Ochlerotatus*), 194, 195, 217, 218
maculipennis (*Anopheles*), 193, 261, 263, 277
major (*Bombylius*), 44
marginalis (*Culex*), 263, 277
mellinum (*Melanostoma*), 232
morsitans (*Theobaldia*), 192, 195, 261, 262, 263, 286
mutabilis (*Microdon*), 186
nemorosus (*Ochlerotatus*), 192, 194, 195, 218, 219, 220, 264, 277
nitidulus (*Culex*), 220, 261, 263
nigra (*Physocephala*), 330
nigripes (*Anopheles*), 194, 220
**nivipous* (*Uranotænia*), 93
Ochlerotatus, 193, 261
ornatus (*Culex*), 219, 263, 277
palpalis (*Glossina*), 29
penicillaris (*Culex*), 195
pertinax (*Eristalis*), 44
perturbans (*Taniorhynchus*), 261
Phlebotomus, 47
pipiens (*Culex*), 192, 220, 263, 277
planifrons (*Platycephala*), 155
plumbeus (*Anopheles*), 193, 194
Pristirhynchomyia, 164
pulchripalpis (*Culex*), 195
punctatus (*Culex*), 263, 277
pyrastris (*Catabomba*), 232
richiardi (*Taniorhynchus*), 192, 218, 261, 327
riparia (*Ephydra*), 155
rossi (*Anopheles*), 98
rufus (*Culex*), 263, 277
rusticus (*Culex*), 263
salinus (*Ochlerotatus*), 192, 194, 219
scutellaris (*Hictodesia*), 306
simplex (*Sciomyza*), 43, 82
Simulium, 47, 273
stephensi (*Neocellia*), 98
sylvæ (*Culicada*), 220
sylvaticus (*Culex*), 277
sylvestris (*Culex*), 195, 264
Taniorhynchus, 193, 261
terrieri (*Culicada*), 219
theobaldi (*Theobaldia*), 193, 218, 262, 263, 277, 286
Theobaldia, 192, 193, 286
uliginosa (*Spilogaster*), 44
vexans (*Ochlerotatus*), 192, 194, 195, 264
vittiger (*Syrphus*), 44
waterhousei (*Culicada*), 218

Order XXII. HYMENOPTERA.

- aceris (Phyllotoma), 284, 346
 adalaidella (Nomia), 119
 aenea (Nomia), 119
 algicola (Paragryon), 99
 Andrena, 45
 annularis (Polistes), 273
 Apanteles, 127
 argentifrons (Nomia), 120
 aricensis (Megachile), 175
 atratulus (Anergates), 345
 *atriventris (Paramesius), 100
 aulicus (Mesoleius), 233
 aurifrons (Nomia), 13
 australica (Nomia), 121
 basalyformis (Spilomicrus), 100
 bolivari (Vesperius), 191
 Bombus, 351
 cæspitum (Tetramorium), 345
 chalybeata (Nomia), 12
 Ciliassa, 42
 *citrullina (Xenoglossa), 177, 178
 coarctata (Ponera), 345
 contracta (Allua), 341
 corticalis (Leptothorax), 82
 cullumanus (Bombus), 351
 dentatus (Metopius), 78
 doddii (Nomia), 120
 Dolerus, 44
 elegans (Paracolletes), 177
 ellioti (Nomia), 10
 erichsoni (Nematus), 233
 fasciipennis (Megalyra), 77
 ferruginea (Osmia), 43
 filicornis (Spilomicrus), 100
 flava (Philibertella), 175
 flavoviridis (Nomia), 119, 120
 floralis (Nomia), 13
 formosa (Nomia), 11
 *frenchi (Nomia), 120
 fruhstorferi (Nomia), 13
 fuliginosus (Lasius), 84
 fusca (Formica), 186
 generosa (Nomia), 120
 germanica (Vespa), 130
 gigas (Camponotus), 250
 gracilis (Cælius), 285
 gyanmensis (Nomia), 13
 halictella (Nomia), 13, 122
 hemipterus (Spilomicrus), 100
 Hoplonomia, 9
 iridescens (Nomia), 12
 kurandina (Nomia), 121
 labralis (Microcryptus), 233
 lenticula (Megachile), 176
 leucocephala (Tetralonia), 177
 lucorum (Bombus), 350
 maculitarsus (Nomia), 13
 manicatum (Anthidium), 43
 maritima (Alysia), 155
 maritima (Idiaspa), 155
 *maturans (Nomia), 10
 *mediorufa (Nomia), 12, 13
 Megalyra, 77
 *megasoma (Nomia), 11
 Meteorus, 4
 mirabilis (Nomia), 9
 nitidulus (Formicoxenus), 345
 noctilio (Sirex), 39
 Nomia, 9
 obfuscatus (Meteorus), 5
 obscuripes (Galesus), 100
 Odynerus, 271
 (Ecophylla), 187
 opposita (Nomia), 13
 opulenta (Nomia), 10
 Osmia, 346
 Oxyura, 106
 papaveris (Osmia), 43
 Paracolletes, 176
 Paranomia, 11
 parvula (Ceratina), 43
 *pavonura (Nomia), 11
 pedisequa (Loxotropa), 99
 *pedissequus (Spilomicrus), 100
 *philinea (Megachile), 176
 *pilosus (Spilomicrus), 100
 pini (Lophyrus), 129
 planiventris (Nomia), 9, 11
 pruinosa (Xenoglossa), 177, 178
 pseudoceratina (Nomia), 122
 Psithyrus, 351
 pulchricornis (Meteorus), 128
 *punctulata (Nomia), 9, 10
 *pyretorum (Anomalion), 195
 quadrifasciata (Nomia), 10
 reitteri (Vesperus), 161
 rufa (Formica), 345
 rufocognita (Nomia), 121
 ruginodis (Myrmica), 186
 *satelles (Nomia), 120
 semiaurea (Nomia), 121
 serotinus (Sphinctus), 78, 79
 smithella (Nomia), 121
 soroensis (Bombus), 351
 Sphinctus, 79
 spinosus (Paramesius), 100
 takauensis (Nomia), 9, 13
 terrestris (Bombus), 350
 thoracica (Bombus), 11
 *Trichocolletes, 176
 tuberoaffinis (Leptothorax), 315
 tuberum (Leptothorax), 82
 turneri (Paracolletes), 177
 umbratus (Lasius), 186
 venustus (Lamprocolletes), 176, 177
 venustus (Trichocolletes), 176
 Vesperus, 161
 vexator (Meteorus), 4
 vexator (Perilitus), 4
 vulgaris (Vespa), 130
 Xylocopa, 43, 330



A
7



8



11

9



12

10



13



THE ENTOMOLOGIST

VOL. XLV.]

JANUARY, 1912.

[No. 584

EDITORIAL.

WITH very great pleasure we have to announce that Mr. CHARLES JOSEPH GAHAN has been good enough to join the Reference Committee of this Journal. As an authority on Coleoptera, Mr. Gahan is so widely known that his association with the 'Entomologist' will enlarge its field of operation, and so enhance its usefulness as a "Journal of General Entomology."

As there appears to be some misconception about the date of publication of the first volume of the 'Entomologist,' we may mention that No. 1 of Vol. I. was issued on November 1st, 1840, and No. 26—concluding the volume—in December, 1842.

In 1843, and for some twenty years afterwards, the 'Entomologist' was merged in the 'Zoologist,' but in May, 1864, it was revived, and has continued to appear month by month from that date up to the present time. It should be stated that the first six volumes were double—that is, they each comprised the numbers for two years.

ON THE VARIATION OF *EUSTROMA* *RETICULATA* (SCHIFF.)

BY LOUIS B. PROUT, F.E.S.

(PLATE I.)

My little note on Mr. Nurse's interesting aberration of *Eustroma reticulata* (Entom. xlv. p. 59) seems to have attracted some attention, and has been instrumental in bringing me some really astonishing information as to the occasional capacity for variation of this usually constant species.

In February Mr. Frank Littlewood, of Kendal, sent me a very fine photograph of the pick of a long series bred by himself

and Mr. George Holmes, of Kendal, and it is only extreme pressure of work that has prevented my calling attention to them earlier. Then more recently Mr. B. H. Crabtree, of Levenshulme, Manchester, followed with a photograph of some extraordinary forms bred by Mr. H. Murray, of Carnforth, in 1893, and now in Mr. Crabtree's collection—probably some of the most remarkable aberrations of the species in existence. Our Editor has wisely made arrangements for all to be presented to readers of 'The Entomologist' together, and I believe they furnish a new chapter in the written history of *E. reticulata*.

To begin with Mr. Littlewood's photograph as the first which reached me—although chronologically his specimens are the younger. Since 1904, when (after an interval of eight years) *E. reticulata* was rediscovered through the energy of the Rev. A. M. Moss, Mr. Littlewood, Mr. Holmes and others have profited by his generosity in putting them into the way of working for it, and have bred it in good numbers. I may perhaps be allowed to say in parenthesis that Mr. Littlewood has accumulated some very interesting notes on the early stages, which I hope he will be induced to publish at no very distant date. The specimens figured are, I understand, the pick of the breeding of the years which have supervened on the said rediscovery. Mr. Littlewood and Mr. Crabtree both agree with my remarks as to the general constancy of the species.

Figs. 7 and 14 represent the two ordinary forms (both about equally common), and show that the normal range of variation is restricted to a difference in the degree of approximation of the antemedian and postmedian lines on the costa, as mentioned in my note above referred to. The other specimens are all aberrant in some way, some strikingly so. The frequency of asymmetry is a noteworthy feature; it will be recollected that the two most striking aberrations previously described (Mr. Nurse's and Mr. Webb's) are both asymmetrical. In Fig. 8 the asymmetry, though slight, is curious, probably even unique; on the right fore wing the first median (vein 3) is only white as far as the postmedian line instead of to the termen. Fig. 9 speaks for itself; the abnormality, it will be noticed, is confined to the left fore wing. Fig. 10 I take to be roughly the ab. *ovulata*, Borgmann, though his example may probably have had the central mark more nearly oval—more as in Mr. Crabtree's Fig. 4. Figs. 11 and 12 are a noteworthy asymmetrical pair, each with one wing of the *ovulata* form. In Fig. 13 the antemedian double white line is broadly coalescent on both wings.

Still more strange are some of Mr. Crabtree's aberrations, all of which, however, are full sized and well formed, so that one cannot attribute them to arrested development. Fig. 4 is a fine extreme example of ab. *ovulata*. Nos. 2, 3, and 5, though differing widely *inter se*, may be considered as having something

in common in their general "make-up," illustrating in varying degree the potentialities of "concentration" of the dark colour into costal blotch or blotches, of which I spoke in discussing Mr. Nurse's and Mr. Webb's aberrations. As this phase of variation now proves to be recurrent, and not entirely confined to asymmetrical manifestation, I think it convenient to give it a special name, ab. *costimacula*, nov. ab., and designate Fig. 5 the type thereof. Those who believe in naming *every* differentiable form may like to add names for Figs. 2 and 3, but I prefer to cover by the name all forms which have a dark blotch in the middle of the costa followed by a suffusion of white in the middle of the wing. The distinctions between the three specimens in question are well shown in the figures: No. 2, with its very extended pale area and the blurred inner marginal markings, is the most extraordinary; Fig. 5 is on the *right* wing intermediate between *costimacula* and *ornulata*.

As regards Fig. 6, it is the only example yet known in which the ground-colour, as well as the scheme of markings, has materially changed. The parts which are ordinarily brown (and which, in spite of their reduction, I still regard as theoretically the "ground-colour") are ochreous, only a shade darker than in *Perizoma flavofasciata* (*decolorata*), while the white parts are duller white than is typical. The general scheme somewhat suggests a nebulous ab. *costimacula*, vaguely akin to that in Fig. 5.

A NEW ABERRATION OF ZONOSOMA LINEARIA.

By LOUIS B. PROUT, F.E.S.

THE very interesting aberration of *Zonosoma linearia* figured (Plate I., fig. A) was taken by my friend, Mr. D. P. Betts, in Epping Forest, on June 5th, 1908, and is now in Mr. South's collection. As is well known, this species varies a good deal in the precise position and thickness of the median line (or shade), and I myself have one pretty specimen in which it is thickened just as in Mr. Betts's. But what gives to the new aberration its distinctive charm is that the entire space between this line and the postmedian on both wings is suffused with smoky, resulting in the formation of a definite postmedian band, which is faithfully brought out in the figure. The under side shows the same peculiarity, though more faintly. The only specimen previously known to me which could possibly be described as "banded" is that figured by Barrett on Plate 329, fig. 1c, of his 'Lepidoptera of the British Islands,' in which the dark shading that accompanies the median line is *proximal*, not distal. On the other hand, it is of interest to note that a specimen of the allied *Z. punctaria*, which was sold in the

collection of the Rev. G. H. Raynor (bred from Colchester), shows a parallel variation to Mr. Betts's *linearia*, and Barrett figures one or two aberrations of *punctaria* beginning to approach it; while a very similar scheme is normal in *annulata*, and is well known among other branches of the Acidaliinæ—*Ptychopoda aversata*, *deversaria*, &c. Although I do not consider it always expedient to give special names to single aberrations, the present is sufficiently striking and definite to warrant it, and I therefore christen it *Zonosoma linearia* ab. *fasciata*, nov. ab.

REDISCOVERY OF THE BRACONID *METEORUS VEXATOR* (HAL.), WITH A DESCRIPTION OF THE MALE.

By CLAUDE MORLEY, F.Z.S., &c.

In his "Essay on Parasitic Hymenoptera" in the old Ent. Mag. (1836, p. 33), A. H. Haliday describes a new species, *Perilitus vexator*, in the female sex only—"Habitat cum præcedentibus rarus" = "Habitat in nemoribus passim frequens. Femina, locis fungiferis autumnno." This duly appeared, with no addition, in the Rev. T. A. Marshall's 1872 Catalogue of British Hymenoptera, and the original description was reproduced by the same author in his Monograph of British Braconidæ (Trans. Ent. Soc. 1887), with that of its supposititious male. Both sexual descriptions were copied in André's Spp. Hym. d'Europ. 1891, p. 86, with the remark: "J'ai ajouté ce qui concerne le ♂ d'après un mauvais exemplaire de ma collection; pourtant la réunion des sexes ne paraît pas incertaine, à cause de la grandeur exceptionnelle du stigma." In Entom. 1908, p. 125, I gave a table of British *Meteorus* species, assigning *M. vexator* a position based upon its description alone. This is all we knew of the insect—one or more Irish females and a doubtfully associated male.

From a black, hemispherical fungus—almost certainly *Stromatosphæria concentrica*—Mr. J. H. Keys recently sent me from Plymouth two female *M. vexator*, which were bred along with a lot of the clavicorn beetle, *Diphyllus lunatus*, Fab., during August, 1911; no other host or parasite emerged from the fungus, which constitutes conclusive evidence of parasitic association. I at once enquired whether no males were also raised, and Mr. Keys has kindly presented me with the only one bred: in all six females and one male *Meteorus* appeared among numbers of the beetle.

The true male differs from that described by Marshall in having the antennæ no longer than the body, of twenty-six joints, with the basal half dozer ferruginous; metathorax nearly

horizontal to its transcarina, which in both sexes is centrally interrupted by a laterally carinate longitudinal area, and then abruptly declived; on either side of this central area the metanotum is not smooth, but finely shagreened, in both sexes; the wings are even less clouded than those of the female, with costa piceous but nervures testaceous; the stigma is not unicolorous but, exactly as in the female, large and nigrescent piceous with its basal third pure white (= "stigmatate latissimo, fusco puncto pallido"—Hal.); the second cubital cell is subparallel-sided and neither triangular nor constricted towards the radial nervure; abdomen longer than thorax. Length, 27 mm.

The insect is closely allied to *Meteorus obfuscatus*, so frequently bred from the heteromerous beetle, *Orchesia micans*, in dry Boleti on elm and other large trees.

A SUPPLEMENTARY NOTE ON HESPERIID CLASSIFICATION.

By H. ROWLAND-BROWN, M.A., F.E.S.

THE 'Entomologist,' vol. xliii. pp. 306-9, contains "A Note on the New Classification of certain Hesperiid Butterflies," relative to the researches of Dr. J. L. Reverdin and M. Charles Oberthur, in which, *inter alia*, I drew attention to the difficulty of separating the *malvæ-fritillum* forms. Dr. Reverdin has now most kindly furnished me with an extract from the 'Bulletin de la Soc. lépid. de Genève' (vol. ii. fasc. 2, August, 1911), in which he gives the results of his completed investigations on this particular subject.

A close examination of long series leads him to the conclusion that, *superficially*, *Hesperia malvæ*, and the insect which we have known hitherto as *H. fritillum*, Rambur, are practically inseparable. It is only when we come to compare the male appendages that we are conscious of a complete specific difference; but there are one or two points also of structure and habit, which, pending a complete life-history of *fritillum*, Rbr., may assist us to differentiate these perplexing little butterflies. I take the liberty, therefore, to epitomize Dr. Reverdin's several experiments; but, as a preliminary, repeat what I have already explained in my paper on the species met with by me in the Basses-Pyrénées (Entom. vol. xlv. p. 335), that *fritillum*, Rbr., is henceforth to be known as *malvoides*, Elwes and Edwards (cf. "A Revision of the Oriental Hesperidæ," Trans. Zool. Soc. xiv. 1898):—

Size: *Malvoides* ordinarily larger than *malvæ* (but not invariably).

Shape of wings: Fore wings of *malvoides* more pointed, and relatively less broad, *malvæ* appears more compact (*ramassé*).

Coloration: *Malvæ* darker; and the white markings, therefore, shown up in stronger relief on the ground colour; in *malvoides*, the general tint rather brownish than actually black; the white spots contrasting less vigorously. (Examples must be quite fresh to demonstrate this difference.) This is due to the hairs which cover the wings being somewhat lighter and whiter in *malvoides*, which is also more abundantly provided with them than *malvæ*.

Fore wings, upper side: No palpable difference in the distribution scheme of the white spots forming the irregular Y in the middle of the wing; but the row of small ante-marginal spots, very clearly defined as a rule in *malvæ*, absent in *malvoides*, or reduced to a few atoms; instead of the spots traces of feeble brownish, lighter than the ground colour.

Hind wings, upper side: Differences even less constant. Usually the median band of white spots with denticulations turned outwards is more extended in *malvæ*.

Fore wings, under side: In *malvoides* the costa, and a thin "piping" the length of the outer margin immediately inside the fringe, ochreous pale yellow; in *malvæ* more or less dirty white.

Hind wings, under side: Normal colour in *malvæ* greyish, in *malvoides* rather yellowish; median band of spots more often carried through unbroken from one margin to the other in *malvoides*; in *malvæ* almost invariably broken at the back of the large spot. In very fresh examples pearly reflections of the white spots more pronounced in *malvoides*. Inner margin in *malvæ* usually greyish, or blackish normally; in *malvoides* whitish or yellowish. Not constant. Black spot in line with the anal angle more obvious in *malvoides*. Tiny black spot in white spot just beyond anal angle fails or almost disappears less frequently in *malvoides* than in *malvæ*.

Nervures: Usual colouring hind wings, either yellow or reddish yellow in *malvoides*; whitish, or of a less pronounced yellow, in *malvæ*.

Antennæ: The club in *malvoides* yellow or tawny, and almost constant; in *malvæ* brown or black almost without exception.

Palpi: In *malvoides*, seen from below, sometimes white, more often pale grey; in *malvæ* sometimes pure black, and more often grey of a deeper shade than in *malvoides*. Seen from above the bunch of black hairs in the middle in *malvoides* usually contains several white or grey hairs; in *malvæ* they are black or blackish. Less constant than the differences of the antennæ.

Joints of antennæ: Less on the average in *malvoides* than in *malvæ*, on the whole; but not constant, some examples even showing a different number on one antenna to the other!

Examination of ordinary and androconal scales inconclusive.

Dr. Reverdin concludes with a number of observations from entomologists in the various countries where it occurs tending

* E. André, 'Lépid. de Saône-et-Loire' (Mâcon, 1902), under *alveus* var. *fritillum*, Hb., writes, quoting Frey, "Under side of the clubs of the antennæ rusty-red."

to show that *malvoides* invariably affects marshy ground, whereas this peculiarity has not been noticed in *malvæ*. I can supplement these with two further observations of my own to the same effect. My Biarritz *malvoides* were taken flying singly in the marshland outside that town; and my Bérisal example (as far as I recollect) in a damp upland pasture near to a mountain stream.

As a result of these discoveries, coupled with Dr. Reverdin's further discovery (based also on the character of the male appendages) that *Hesperia melotis*, Duponchel (= *hypoleucos*, Lederer), is a good species, it follows that some modification and amendment is required in Tutt's exhaustive account of *Hesperia malvæ* ('British Butterflies,' vol. i. pp. 221-255). His var. *pyrenaica* (p. 225), by reason of the date of captures made on the Pyrénées-Orientales, must be referred as a var. of *malvoides*—unless, as I suspect, it be *malvoides* itself. His var. *alpina*, for the same reason, is probably the mountain *malvoides* of Switzerland, and belongs, therefore, to that species.

Lastly, though I observe that Tutt cites and describes var. *melotis*, Dup., and var. *hypoleucos*, Lederer, as two separate varieties of *H. malvæ*—the former occurring at Locarno—Dr. Reverdin (and other authors) regard the names as synonyms of what now appear to be one and the same true species, viz. *melotis*.

Mr. J. Edwards, of Colesborne, having kindly determined for me the specific identity of *H. armoricanus*, Obthr., with *H. alveus*, despite certain pronounced superficial differences, my abstract of the classification of this particular group should now read as follows (cf. Entom. xliii. p. 308):—

To the vars. of *H. ALVEUS* add (g) var. *armoricanus*, Obthr.
For *H. FRITILLUM*, Rbr., read *H. MALVOIDES*, Elw. & Edw.

(a) ? var. *alpina*, Tutt.

(b) ? var. *pyrenaica*, Tutt.

and add *H. MALVÆ*, L.

(a) var. (et ab.*) *australis*, Tutt.

H. MELOTIS, Dup.

PUPATION OF LEPIDOPTEROUS LARVÆ IN GLASS TUBES.

By RUPERT STENTON.

It may not be generally known that lepidopterous larvæ will pupate in glass tubes plugged with cotton-wool, and as far as I

* I notice on p. 224, 'British Butterflies,' vol. i., Tutt gives full varietal rank to *australis*, n. var., but on p. 225 he calls a form from Digne *ab.* (et var.), and another from Draguignan, a few miles away, *ab.* simply.

have observed, a larger proportion will do so more successfully in the artificial cocoon thus made than in the earth or other material provided for them in captivity. Of course, if biological data are desired it is the obvious thing to do, but does not seem to have been hitherto regarded as a simple alternative to the usual and more natural method.

I first noticed that larvæ would so pupate in the autumn of 1910, when an attempt at transferring external parasites to other hosts (Noctuid caterpillars) failed, partly perhaps through the intended victims too rapidly turning to chrysalids in the tubes. Since then, by way of a test, I have placed all my larvæ under the same conditions, and they have all, without exception, turned to healthy chrysalids: and in thus managing them I have found several advantages, among which may be mentioned the elimination of earth, &c., a decreased mortality when changing, being able to feed several species in the same cage without an eventual mixing of chrysalids, and keeping in touch with individual larvæ through to the imago; also, when travelling, to have the difficulties of dealing with larvæ then obtained, which desire to pupate, removed is an advantage, as they can be accommodated *en route* by carrying a supply of tubes and wool.

I must add, though, that I have had nothing like a sufficient number of caterpillars to make a really comprehensive test of the usefulness of this method. But perhaps some collector with greater opportunities, and to whom large boxes of earth and other impedimenta are cumbersome, may think it worth while to experiment.

St. Edward's, St. Mary Church, Torquay, Devon.

AN ATTEMPT TO COLONIZE *PAPILIO MACHAON* IN ESSEX.

By Professor RAPHAEL MELDOLA, D.Sc., LL.D., F.R.S., &c.

In the November issue of the 'Entomologist' (vol. xliv. p. 365) there are three records of captures of this butterfly, one at Bishop's Stortford, one near Kelvedon, and a third at Enfield. The tendency to attribute the occurrence of the insect in districts so far removed from its native habitat to the exceptionally warm summer is quite justifiable, and may be the correct explanation. I remember in 1895, when at Sheringham, in Norfolk, seeing a boy sweep a specimen of *P. machaon* off a flower-head with his net, but this locality is not very remote from fenny districts. With respect to the recent captures in Hertfordshire, Essex, and Middlesex, however, I think it only right to offer a suggestion. In 1909, in the course of a conversation with the Earl of War-

wick concerning a swampy area in the grounds of his estate at Easton, near Dunmow, in Essex, the wish was expressed that this marshy bit could be "naturalized" as far as possible, both with respect to insects and plants. With the concurrence of Lord and Lady Warwick I determined to try and introduce *P. machaon*. Large supplies of the food-plants were procured and planted round the swamp, and in the spring Lord Warwick and I attached six dozen chrysalids of the butterfly to various posts and walls of summer-houses round about. All the butterflies emerged in due course, and were seen from time to time sailing away, but no larvæ were found on the food-plants that season, nor have they been found at Easton since; neither has the butterfly been seen in the grounds. So far the experiment was a failure, and I believe that others who have attempted to introduce this butterfly into new districts have had similar experiences. But there is a lurking suspicion that these "escapes" from Easton may have founded a successful colony, or successful colonies, elsewhere, and that the recently captured specimens may have spread therefrom. Bishop's Stortford is only about eight miles in a bee line from Easton, and Kelvedon cannot be very much further. Enfield is the farthest point from the centre of distribution. It will be interesting to note what happens next season. Of course, it is too much to hope that any specimens seen at large should be simply recorded and not slaughtered. With strange butterflies, as with rare birds, the tendency is to "kill at sight." Had we been successful with the Easton experiment, it is needless to say that no "collecting" of this butterfly would have been permitted.

6, Brunswick Square, W.C.: Dec. 14th, 1911.

SOME BEES FROM FORMOSA.—II.

By T. D. A. COCKERELL.

THE genus *Nomia* is represented in the Sauter Collection by six species, but three others (*N. takauensis*, *N. mirabilis*, and *N. planiventris*) were earlier collected by Sauter and have recently been described, from males only, by Friese. According to the material before me, two species appear to be exceedingly abundant, and these are the species which also occur on the Asiatic mainland. The others, apparently endemic, are represented by few specimens.

GROUP A. (Subg. HOPLONOMIA, Ashmead).

Postscutellum with two large teeth.

Nomia punctulata, Dalla Torre, var. a.

Forty-six specimens, all males. The wings are dusky, and

the first recurrent nervure joins the second submarginal cell beyond the middle; otherwise the insects seem not to differ from the mainland form. Finding no females, I wondered whether *N. maturans* could be the true female, although it is very unlike *punctulata* female as known from elsewhere. Close comparison led me to abandon this idea, for *maturans* differs from male *punctulata* in the duller surface of the mesothorax, the non-bilobed scutellum, and the dull metathorax, with the area merely granular. *N. punctulata* is a Chinese and Japanese species, while *N. maturans* is related to a species of the Philippine Islands.

The Formosan *N. punctulata* all come from Takao, August to October. The abdominal bands are light emerald green, the first two suffused with orange, the last two with purple.

Nomia maturans, n. sp. .

♀. Length about 10–11½ mm.; black, the head and thorax strongly punctured, with rather abundant pubescence, white on cheeks, pleura and metathorax creamy-white on face and prothorax, black on mesothorax and scutellum, but white tomentum along hind border of mesothorax, and a little at the sides, postscutellum covered with white hair, slightly creamy above; head broad; eyes dark brown; mandibles strongly bidentate; clypeus and supra-clypeal area with a delicate but distinct median carina, not reaching the lower margin of clypeus; sides of lower half of clypeus carinate; antennae black, with the fourth joint red beneath, and the apical part of the flagellum reddish beneath; front shining, strongly and closely punctured; a flattened, slightly concave smooth area at side of each lateral ocellus; mesothorax dull, with very large strong punctures, sparse in the middle posteriorly; scutellum with strong widely separated punctures; postscutellum with two large triangular teeth; metathorax dull and granular, the area with a more coarsely granular band, the lateral areas strongly punctured; tegulae black with creamy-white margins; wings dusky, stigma dark ferruginous, nervures brown; second s. m. rather broad, receiving first r. n. much beyond middle; legs black, with mainly white hair, ferruginous on inner side of tarsi; abdomen sparsely punctured, segments two to four with broad tegumentary orange bands, sometimes flushed with emerald green.

Hab. Takao, Formosa, three collected November 10th, 1907. Evidently closely allied to *N. quadrifasciata* (Ashm.) from the Philippine Islands; the first distinctly Philippine type I have noted among the Formosan bees. Some years ago I hastily examined Ashmead's type of *N. quadrifasciata*, but only noted that the abdominal bands were green tinged with orange-vermilion. Ashmead's description of *N. quadrifasciata* is rather incomplete, and his account of the legs of the female is evidently based on a male. In the colour of the abdominal bands, *N. maturans* also recalls *N. opulenta*, Smith. In Bingham's work on the 'Hymenoptera of India' it runs in the table to *N. elliotii*,

Sm., from which it differs at once by the colour of the bands and the absence of a band on the first segment. According to Friese, *N. elliotii* also occurs in Formosa.

GROUP B. (subg. PARONOMIA, Friese).

Postscutellum unarmed; abdomen with coloured tegumentary bands.

Nomia thoracica, Smith.

The specimens have been compared with a *thoracica* from F. Smith's collection. Thirty specimens, including both sexes, all from Takao, July to October. Easily known from the other Formosan species of this group by the dense covering of moss-like fulvous or ferruginous hair on the thorax above.

Nomia megasoma, n. sp.

♀. Length about 13½–15 mm.; black, the head and thorax finely punctured, clothed with fulvous hair, that on the mesothorax not hiding the surface; mandibles thick, bidentate; clypeus shining, with scattered punctures, and with a median keel which is strong above, evanescent below; supraclypeal area convex, not keeled; antennæ black, the scape long, the flagellum obscurely ferruginous beneath; vertex angulate behind ocelli; front finely rugosopunctate; mesothorax dull, finely and rather closely punctured, scutellum irregularly punctured, the punctures of different sizes; metathorax shining, with scattered punctures, more or less in rows; basal area consisting of a broad shining transverse sulcus, crossed by raised lines, and a V-shaped median apical smooth area; tegulae rather large, bright ferruginous; wings dusky, strongly orange-tinted, the apex with a dark fuscous patch; stigma and nervures ferruginous; first r. n. joining second s. m. near its base, legs black with ferruginous hair, the tarsi dark reddish; abdomen shining, sparsely punctured, the punctures on first abdominal segment distinctly larger than those on second; first two segments with fulvous hair, the others with mostly black, but fulvous at sides, hind margins of segments two to four with pale orange tegumentary bands, which are narrow, only covering about half of the apical depression; venter with much red hair.

Hab. Formosa (no special locality given); four specimens. In Bingham's table this runs nearest to *N. thoracica* and *N. formosa*, but does not closely resemble these species. *N. planiventris*, Friese, of which only the male is known, appears to be very similar, but the outer margin of the wing is dark, not merely the apex. I am not sure that *N. megasoma* is not the female of *planiventris*, but, after carefully going over Friese's description, I have thought it best to regard it as distinct.

Nomia pavonura, n. sp.

♂. Length about 12 mm.; black, the head finely and irregularly punctured, the shining mesothorax and scutellum strongly and quite

closely; head and thorax with very pale ochreous hair, white on lower part of pleura, light fulvous on sides of metathorax, on mesothorax and scutellum strongly mixed with dark fuscous; eyes strongly converging below; clypeus finely rugose, it and the supraclypeal area with a longitudinal carina; front densely punctured; hair on anterior part of cheeks shining silvery; antennæ long, black, basal half of flagellum with a poorly defined red band beneath; scutellum moderately bigibbous; metathorax shining, the basal area smooth, with a fine transverse raised line separating the apical part; tegulæ pointed behind, testaceous with a large piceous patch; wings faintly dusky, more strongly so on apical margin; nevures and stigma dusky ferruginous; first r. n. joining second s. m. beyond middle; legs black, with pale hair, reddish on inner sides of tarsi; hind femora moderately swollen, flattened beneath; hind tibiæ thick, trigonal, strongly curved, the broadly truncate apical lobe light yellow, stained at end with ferruginous; hind basitarsus pallid on outer side near base; abdomen more or less metallic, with purple tints, very strongly punctured, with broad tegumentary bands (occupying much more than half of the apical depression) on segments two to five; in the type the last two are iridescent, with brilliant emerald green and purple colours, while the other two (doubtless abnormally) are dull greenish; in a second specimen they are all dull greenish; penultimate segment with a dentiform lobe on each side; apex very broad, emarginate.

♀. Similar, but more robust, with the usual sexual differences; abdominal bands three, green without purple; hind femora beneath with a curled fulvous scopa, but scopa of hind tibiæ white; flagellum bright ferruginous beneath except at base; mesothorax and scutellum with most of the hair black or dark fuscous; scutellum with a median groove; basal sulcus of metathorax rather faintly beaded laterally; abdomen not so strongly punctured as in the male.

Hab. Takao, Formosa, August 18th, 1907, one female. The female approaches *N. iridescens*, Smith, but is much larger, with very much larger punctures on the two basal segments of abdomen. The closest affinity is with *N. chalybeata*, Smith, which differs in the colour of the thoracic pubescence. The insect may be regarded as the Formosan representative of *N. chalybeata*. The type is a male.

GROUP C.

Postscutellum unarmed; abdomen with hair-bands; tegulæ not enlarged.

Nomia mediorufa, n. sp.

♀. Length about 8 mm.; black, with the flagellum (dusky in middle above), the basal two-thirds or more of the first abdominal segment, the knees, the anterior tibiæ (with a large dusky cloud) and the tarsi ferruginous; pubescence of head, thorax, and legs fulvous, nowhere becoming white; head transversely suboval, eyes strongly converging below; face covered with appressed pale fulvous hair;

clypeus normal not keeled; mandibles red subapically; front, vertex, mesothorax, and scutellum granular from minute dense punctures; basal sulcus of metathorax with fine transverse ridges; posterior face of metathorax dull and rough, with much hair; tubercles, upper border of prothorax and postscutellum densely covered with hair, but surface of mesothorax not hidden by hair; tegulae clear ferruginous; wings dusky, nervures and stigma pale ferruginous; b. n. not quite reaching t. m.; abdomen very finely punctured; hind margins of segments testaceous, with heavy broad fulvous hair-bands, widely interrupted on first segment, thin in the middle on second; apical ventral segment broadly rounded.

Hab. Koroton, Formosa, September 8th, 1907, two females. *N. takauensis*, Friese, was based on males from Takao and Ku-sia, Formosa; it appears to resemble *N. mediorufa*, having the same fulvous pubescence, but the abdomen is not red at base, and the mesothorax and scutellum are much more densely hairy. I do not think *takauensis* can be the male of *mediorufa*. In Bingham's table *N. mediorufa* runs near *N. floralis*, Smith, but the clypeus is produced at apex into a short truncate lobe, not toothed as in *floralis*; the hair of face is pale fulvous, not fuscous as in *floralis*; and the scutellum is closely punctured, while in *floralis* it has scattered punctures. *N. maculitarsis*, Cam., may also be compared, but that species has smooth silvery white apical margins to the abdominal segments.

Nomia mediorufa gyammensis, n. subsp.

♀. Like *N. mediorufa*, but abdomen not at all red basally; legs darker, hind tibiae with dark, fuscous hair on outer side; pubescence paler, the abdominal bands very pale ochreous; flagellum black above except at apex.

Hab. Gyamma, Formosa, April 6th, 1907. This is almost exactly like the Australian *N. halictella*, Ckll., so much so that without very close scrutiny they would be considered identical. *N. halictella* has the wings distinctly darker, and is a larger insect, but the resemblance is most extraordinary, extending to every microscopical detail. It is a question whether *N. gyammensis* and *mediorufa* should not be regarded as races of *halictella*, in spite of the wide geographical separation. Among the Indian species *N. gyammensis* may especially be compared with *N. kangrae*, Nurse, in which, however, the pubescence hides the sculpture on front, and there are other differences. It is easily known from *N. opposita*, Sm., by the smaller size and light nervures, and from *N. fruhstorferi*, Per., by the yellowish hair-bands on abdomen, &c. In Bingham's tables it runs nearest to *N. aurifrons*, Sm., which is very different.

A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Concluded from vol. xlv. p. 389.)

(iv) *Dompierre-sur-Mer, Charente-Inférieure.*

I think the qualification of my title admitted in a previous paper of this series is not required for Dompierre-sur-Mer, which is six miles away from the sea north-east of La Rochelle, in the Charente-Inférieure, and only designated "sur-Mer" to distinguish it from several other Dompierres elsewhere. But Dompierre has a history, and a very remarkable one, which I may briefly state, inasmuch as one incident at least bears directly on the entomological wealth of the region. From La Rochelle to Dompierre, and for some little way further inland, there is a canal, and along the huge bank of excavated earth on the south side runs the railroad to Nantes. At this particular spot the banks are scarcely less than fifty feet deep, and almost perpendicular, so that there it is not possible to scramble up or down, and close to the station is a long tunnel, through which the canalized waters of one of the Sevre rivers (the neighbouring Department is that of Deux-Sevres) are carried. The work was conceived by Louis XIV., and achieved, so far as it goes, by convict labour. But it has never been completed, and the waterway is abandoned. The soil, however, is calcareous, and for two hundred years the immediate surrounding land on each side has been left uncultivated—a wild garden such as one seldom encounters elsewhere in a country where great enclosed estates are unknown, and every inch of available earth pressed into the service of industry. When I entered this No-man's Land, on the morning of August 4th, I must confess that the prospect filled me with dismay. Every blade of grass seemed to have been burnt up by the fierce sunshine of the past weeks, and such land as might have escaped on the railway banks had been devastated by fires. However, I set out for the village of Dompierre, about three-quarters of a mile away, to seek out M. Vigé, the schoolmaster, who is an enthusiastic lepidopterist, and would no doubt guide me to the best localities. Not only did he offer me the warmest of welcomes and the requisite advice, but, net in hand, accompanied me back to the canal-banks, where, despite the drought, a few green oases survived. Now, my chief object in visiting Dompierre was to investigate the wonderful *Lycænid* races, duly recorded and examples of many figured by M. Charles Oberthür ('*Lépid. Comparée*,' fasc. iii., Rennes, 1909). In particular there is the blue form of the female of *Agriades thetis* (= *bellargus*), ab. *cœlestis*, Obthr., in

which the upper side of the wings is suffused entirely with a silky blue, closely approximating to the colour of typical males. I may say at once that I did not have the good fortune to net a single one. The males of the second generation were just coming out, the one sole female, observed *in cop.*, being of the normal and, at Dompierre apparently, the rarer form. Thus, just as at Angoulême, in Charente, I had been too early for the *caelestis* of the first brood, here I was in advance of the next emergence. Still, there were many compensations in store for me, for *A. thetis* is not the only member of the family which exhibits this remarkable tendency to "cæruleanism" in the female. *A. corydon* was well out, the males in hundreds flitting over the dry grass-bents, with rarer females, all of which, or nearly all, were ab. *tithonus*, Mieg. (= ab. *syngrapha*, Kef.), and I was able to collect on this day and the morning of the 5th a very respectable series of this exquisite butterfly. In size they show great variation, from about the dimensions of a large *Cupido minimus* to those of the fine well-developed British type; while I took one with the nervures superimposed blue, and striated as in the remarkable form first described from a less pronounced example by Gaschet as ab. *radiosa* (cf. 'British Butterflies,' Tutt, iv. p. 31).* I gather further from M. Oberthur's illuminating account of the species that the blue female form predominates here over the brown, and though there were many fine richly coloured brown females in evidence, the *tithonus* form was decidedly the commoner of the two. In the case of *Polyommatus icarus*, also abundant on the wing in both sexes, I could observe no marked predominance of the blue form; indeed, it was decidedly less in evidence than I have found it on the Chilterns and other English localities where "blues" are common. I took, indeed, but one worn female corresponding in detail to the ab. *supracærulea*, Obthr. (*op. cit.* p. 147). None the less, it is worthy of observation that in this *natural* locality the blue females of the *Agriades* group should apparently tend to oust the "brown," while another still more remarkable feature is the extraordinary frequency hereabouts of androgynous *P. icarus*. M. René Oberthur informs me (*in litt.*) that his collector in the spring of 1911 brought back no fewer than twenty-seven such examples—surely a record! Single *Everes argiades*; *Lampides bœticus*, common round the acacia-bushes; two or three belated *Lycæna arion*, which I was unable to net; *A. medon*, of the second emergence; and, less frequently, *Nomiades semiargus* complete the tale of "blues" upon the wing. But M. Vigé tells me that Dompierre produces *L. alcon*, and *P. escheri* var.

* M. l'Abbé Gaschet's *radiosa* is described from examples taken also in the Charente-Inférieure—St. Georges, near Royan, which is in the extreme south-west of the Department, as Dompierre is in the extreme north-west. It is probable, therefore, that the aberration is not unusual in this region.

helenæ, Obthr., has, of course, been distinguished and named quite recently by M. Charles Oberthür from examples taken in this same district.

But, notwithstanding the arid condition of the soil and the exhausted verdure both of plants and trees, there were countless butterflies besides *Lycænidae* upon the wing. The fast-fading clumps of valerian on the railway bank were clustered with *Colias edusa* and *C. hyale*, and occasional *Pontia daphidice*; while on the outskirts of a little pine-wood, which filled the whole air with sweet resinous odour and afforded a grateful shade, fresh examples of *Papilio machaon* were chasing each other with an energy we poor perspiring mortals might well envy. *Pyrgus sao*, isolated *Carcharodus alceæ*, and *Nisoniades tages* represented the "skippers," while every blue thistle was alive with *Epinephela tithonus*, and the driest pathways and glaring masonry of the canal with *Hipparchia arethusa*; that other heat-loving Satyrid, *H. briseis*, being not yet emerged. Of the Argynnids I saw nothing; they must have been well over in this forward season, but a fresh brood of *Melitæa cinxia* was about, and some very small but lively coloured *M. phæbe*. Several stout Anthrocerid larvæ also found their way into the net, although the only member of the family on the wing was *A. fausta*, very small and in brilliant condition.

But the sands of holiday-time were already running low, and I could only give Dompierre a second visit of a few hours on August 5th, though in a normal year, throughout the collecting season, a profitable month might be spent in the Charente-Inférieure. The difficulty is to work this locality from comfortable headquarters. The best way, I should think, to reach La Rochelle is by steamer to La Pallice from Liverpool, thus avoiding the tiresome journey across France; or, if the long sea-voyage is not convenient, *via* Southampton, St. Malo, Rennes, and Nantes. The trains stopping at Dompierre from La Rochelle are, however, very limited in number, and there seems no alternative between spending the whole day there from ten to six, or returning a few hours before noon. But there is a small café opposite the station, kept by a sympathetic landlord, who waxed eloquent on the entomological treasures of his locality; and it is, therefore, not necessary to transport *déjeuner*, a consideration when box-room is limited, and the sun making every ounce, human or otherwise, tell against the carrier of bag or satchel. I cannot recommend the small hotel in which I put up at La Rochelle, but I dined each evening at the Hôtel du Commerce in the Place d'Armes, and it appeared to be admirably managed.

BUTTERFLIES OBSERVED AT DOMPIERRE-SUR-MER, CHARENTE-INFÉRIEURE, AUGUST 4TH AND 5TH, 1911.—*Carcharodus alceæ*; *Pyrgus sao*; *Nisoniades tages*; *Lycæna arion*; *Nomiades semi-*

argus; *Agriades corydon*, and ab. *tithonus*, and ab. *radiosa*, *A. thetis*; *Polyommatus icarus*; *Aricia medon*; *Everes argiades*; *Celastrina argiolus*; *Lampides bœticus*; *Papilio machaon*; *Pontia daphidice*; *Colias hyale*, *C. edusa*; *Gonepteryx rhamni*; *Melitæa phœbe*, *M. cinxia*, *M. didyma*; *Pyrameis cardui*, *P. atalanta*; *Aglais urticæ*; *Polygonia c-album*, *Pararge megæra*; *Hipparchia semele*, *H. arethusa*; *Epinephele jurtina*, *E. tithonus*.

HarroW Weald: December, 1911.

THE IMMIGRATION OF PYRAMEIS ATALANTA.

By Major B. TULLOCH, F.E.S.

I HAVE been much interested in reading in various numbers of the 'Entomologist' discussions as to whether *P. atalanta* is a regular immigrant to the British Islands or not.

Without wishing to lay down the law in any way, and say definitely that *P. atalanta* does or does not immigrate regularly, yet I should like to make a few observations bearing on the subject, and relate certain facts that have come under my own observation. There are always two sides to every question, and my remarks may tend to prove that I am an "anti-immigrationist." As a matter of fact, I have an open mind on the subject, but I am afraid I cannot enter into any wordy warfare with such eminent authorities as Mr. Frohawk, for instance, as I am too far away. Therefore, from the safe distance of Hong-Kong I can only state facts as known to myself, and leave others to draw their own conclusions.

My life at school, and afterwards as a soldier, has led to my having lived at certain places which were peculiarly well placed for the observation of the movements of butterflies across the sea. I can also lay claim to have been an observer of butterflies and moths ever since I can recollect catching beetles in the sand on the neutral ground of Gibraltar about 1874. Since then I have lived, amongst other places, at Dover (one period of three years, and another of two years), at Guernsey one and a half years, Alderney one year, Malta one year, Mauritius two and a half years, and now I am on another island—Hong-Kong.

Now, of the above places, Dover, Malta, and the Channel Islands are situated on the known lines of flight of migrating birds.

Before continuing the subject further I should like to ask the upholders of the theory of the immigration of butterflies, and of *P. atalanta* in particular, whether they will agree to the fact that butterflies do not fly by night, or on cloudy days (in England, but not necessarily in the tropics), or when there is a

strong east wind blowing or a stiff south-wester, nor as a rule before 10 a.m., nor after 4 p.m., except to sun themselves? I should also like to know whether they consider that *P. atalanta* immigrates in swarms or singly, whether they are supposed to come from the east from Germany, Holland, and Belgium, or from the south from France? If they come from the east, they can only come on an east wind, which they hate, and the distance across the North Sea is too far for them to travel in a day—and by night they do not fly. If they are supposed to come from France in the spring, then any reference to meteorological records will show that in late spring or early summer there are a very great number of days when a strong cold east wind blows; in fact, I have recollections of east winds prevailing all through May. If the butterflies immigrate in swarms, then surely some entomologist in North France must have noted the gatherings preparatory to migration, in the same way that swallows gather preparatory to their autumn flight abroad. If it is contended that *P. atalanta* comes over by single individuals in the spring, then what theory is advanced that it should only enter the head of certain individual butterflies to migrate, and must not the number of individuals be very great to admit of their spreading over England?

I have previously stated that Dover, Malta, and the Channel Islands are places on a regular line of migration for birds. Any day during spring or autumn, about the time that certain birds migrate, you will find those birds at Dover, Malta, and the Channel Islands in places where you do not see them at any other times. For instance, standing on the shore at Dover, one can observe the swallows coming to land, and in my garden on the outskirts of the town during the migrating season I have seen numbers of warblers and small birds that live outside towns. Now apply the preceding remarks to the migration of *P. atalanta*. It can only arrive by day, during a limited number of hours, from France, on a south-east to south-west breeze, not too strong, at certain times of the year, and the sun must be shining, and there must not be any abnormally large gathering of the butterflies reported on the north coast of France. Given the above conditions, has anybody noticed *P. atalanta* arriving over the sea in sufficient quantities to spread all over England and be the parents of the autumn specimens? Personally I have never noticed them, and for the five summers that I lived at Dover I suppose I was on the cliffs or in a boat pretty well every fine day that was possible, and I take it that Dover is the most advantageous place possible in which to note the arrival of "red admirals." I have noticed every year in my garden in spring abnormal numbers of small birds immigrating and going inland, but never abnormal numbers of *P. atalanta*, and yet the autumn brood appears regularly. I always "sugar" for *P. ata-*

lanta in the early autumn because I like watching them (not to "collect" them), and the autumn supply always seems to me to be pretty constant, however few I may have seen in the spring. Neither have I observed any numbers passing the Channel Islands.

At Alderney, in 1892, there was a perfect plague of *Colias edusa* and *Macroglossa stellatarum*, but they remained in Alderney the usual period, and did not leave the island. Will somebody turn up the back files of the 'Entomologist' to see whether 1892 was a clouded yellow year in England or not?

In Malta, *P. atalanta* is a very common insect. It appears to have a succession of broods there. I had particularly good opportunities of observing the insect in that island, as my road to work every day led me past a spot where the insect bred freely. I could always find it in one or other of its stages, and when the perfect insects emerged I never noticed that they moved far from the particular locality, neither did the numbers of butterflies appear to diminish as though they migrated, although Sicily and Italy are handy places for them to go to.

Being very keen on sea-fishing and rowing, I spend many days on the water, and at none of the islands where I have lived have I seen any migration of butterflies, not even at Dover.

Individual butterflies of course I have seen, but those I always put down to chance ones, blown off shore, or those that have lost their way. One day, when steaming near Aden, a sudden squall came off shore and brought with it hundreds of locusts and many butterflies, which afforded amusement to the children on deck, who enjoyed a butterfly and locust hunt at sea, but nobody could say that either insect was migrating. One often reads in accounts of tropical butterflies about the migrating swarms of certain kinds, and especially species of *Catopsilia* and *Callidryas*. Has anybody ever followed up a swarm, or had a correspondent at the other end of the line of flight to say where the butterflies ceased their wild career? I take it the answer is "No," because it is generally impossible in the tropics to go straight across country, on account of the jungle. In Mauritius, however, I once did see a migrating swarm—or rather thought I did. It happened that one bright day when the south-east trade wind had died away and a "Malagash" wind, *i. e.* a westerly breeze from Madagascar, was blowing, that I went butterfly hunting on the Trou-aux-Cerfs. Now a "Malagash" wind only blows but very rarely, and when it does, the atmosphere is very clear and bright but hot. The Trou-aux-Cerfs is an extinct volcano, with a well-formed crater, perfectly circular, filled with jungle, and on the outer sides grow small trees, bushes, and lots of grass and *Lantana*. On arriving near the top of the crater, and whilst collecting on the outside slope, I noticed that there was an abnormal number of *Atella phalantha*

about, a common insect at any time in Mauritius. Soon I noticed that they were in immense numbers and all flying in one direction, *viz.* up towards the top of the crater and down wind, *i. e.* towards the east. Here at last I thought is a migration of butterflies, such as I have often read about. Then the thought occurred to me, "Where do they go to when they get to the top of the crater—do they go right up into the air and drift away to sea, and what happens to them there?" This seemed a problem that I could solve if I climbed to the top and looked to see whether they went away in any given direction, probably going straight before the wind. Up I went to the top, when I found that the insects did not go any higher, but just made a bee line for the other side of the crater, one after the other—thousands of them. Then I walked round to the other side, when I found to my astonishment that they were now all going downhill. This required some further explanation, so downhill I went after them till I got nearly to the bottom of the Trou, when I found that the swarm was now going right-handed round the base of the volcano. After them I went round to the other side again, where I had been before, when I found that the swarm went uphill! In fact, the butterflies were all going on an endless round, up the hill, across the top, down again, and round to where they started. So much for a migration when followed up. Why the butterflies did it I don't know; perhaps because as it happened to be a particularly fine day they were feeling extra fit and happy, and were indulging in a butterfly game. Possibly somebody will explain, for I cannot.

Hong-Kong, South China: August 11th, 1911.

A SECOND LIST OF THE APHIDIDÆ FOUND IN KENT.

By FRED V. THEOBALD, M.A., F.E.S., &c.

(Concluded from vol. xliv. p. 899.)

Genus *HYALOPTERUS*, Koch.

Hyalopterus flavus, Kittel.—On cultivated aquilegias in a garden in Wye, found by Mr. Alban Duffield, June 6th, 1911; a few winged and wingless females.

H. dilineatus, Buckton.—On the upper surface of young rose leaves, Wye, May 21st, 1911. All wingless females in small colonies along the middle of the leaves.

Genus *CHAITOPHORUS*, Koch.

Chaitophorus versicolor, Koch.—On maple leaves, Wye, May 5th to June 25th; winged and wingless females. Also at Hollington Wood, near Hastings, May 12th, 1911. This is given by Schouteden as a

variety of Linnæus's *populi*, which I have been unable to find in Kent.

C. salicivorus, Walker.—Wye, on the under side of willow leaves. Very pale and sluggish, all wingless females, July 10th, 1911.

C. capree, Koch.—Wye, on willows, July 10th, 1911, under the leaves. Winged and wingless females.

Genus CALLIPTERUS, Koch.

Callipterus quercus, Kaltenbach.—Wye; abundant on oak leaves in June, and on to September 22nd. Winged females and young under and on the leaves, and producing much honey-dew, especially abundant high up on the trees. The species and the *quercus* of Kaltenbach are placed in Mordwilko's genus *Tuberculatus*.

C. castanææ, Buckton.—Godmersham; beneath leaves of the sweet chestnut, June 9th and 29th, 1911. Winged and wingless females. Placed in the genus *Myzocallis*, Passerini, by Schouteden.

C. alni, Fabricius.—Wye; common on alders by the old river. Winged females and larvæ, &c., under the leaves and causing little or no harm, very numerous from June to August. None seen in September. Many winged females also occurred on willows, osiers, hazel, and on water grasses growing under and around the alders. Schouteden now places this in *Pterocallis* of Passerini.

C. carpinu, Koch.—Wye, July 14th, 1911, a few apterous females on birch leaves, very uncommon in the neighbourhood. Schouteden makes this the same as Goetze's *coryli*. From a casual examination so far it seems distinct.

C. quercus, Kaltenbach.—Under oak leaves, Wye, July to September. The adult winged females skip readily, whilst the apterous females crawl backwards and stick tenaciously to the leaves. Not abundant. Also from Pitlochry, N.B., September 7th, 1911.

C. betulicolæ, Kaltenbach.*—A single wingless female and a nymph on under side of birch leaf, Wye Downs, July 30th, 1911, the latter hatched on August 7th. This species was also sent me from Pitlochry, N.B., in September by Mr. A. Duffield. Most on birch, but a few winged females on oak.

C. betularius, Kaltenbach.—A few apterous females and many larvæ under birch leaves, Wye, August 13th, 1911, on the downs.

These last two should also come in *Myzocallis*.

Genus DREPANIDOSIPHUM, Koch.

Drepanidosiphum platanoides, Schrank.—Wye Downs, July 30th, 1911. Many winged viviparous females on maples and sycamores, beneath the leaves, a few only on each leaf, all of the green variety.

Genus APHIOIDES, Passerini (CLADOBIUS), Koch.†

Aphioides (Cladobius) populeus, Kaltenbach.—A single colony of

* Kirkaldy (1905) places this in his genus *Kallistaphis*; it certainly differs from typical *Callipterus*, in which genus Buckton places it.

† Kirkaldy (1905) proposed the new name *Aristaphis* for this genus. Schouteden places it in Buckton's genus *Pterocomma*.

some seventy wingless females from a poplar, Wye, July 14th, 1911. The insects were densely packed on the young wood near the top of a shoot. After several days' searching, I could find no more of this marked species.

Genus PEMPHIGUS, Hartig. (BYRSOCRYPTA, Haliday).

Pemphigus pyriformis, Lichtenstein.—Ulcombe and Bilting, near Wye, June. Galls full of winged females, continued at Bilting until July 9th, when winged females, pupæ and larvæ, still in galls. Also from Haddenham, Cambridgeshire, June 27th, 1911.

P. marsupialis, Couchet.—Bilting, near Wye, July 9th, 1911. Galls found on poplars with the former, but scarce. Winged females and nymphs and a few larvæ.

P. affinis, Kaltenbach.—Bilting, near Wye, July 9th, 1911. Very abundant on poplars with above, notably with the latter on the pointed-leaved poplars. All winged females, many having left the galled leaves. Colour of young galled leaves tinged with red and pink, of older ones pale yellow. The females with very mealy coverings.

P. filaginis, Boyer.—Wye, near railway station, on *Gnaphalium uliginosum*, the marsh cudweed; September 17th, on a few roadside plants. Many apterous females and one winged. Looks much like *P. affinis*,* but slightly distinct. Produces a copious mass of white wool. I failed to find the host plant near Bilting, where *P. affinis* occurs on the poplars some two miles away. At this time there is no trace at all of live *Pemphigus* on the poplars, and it is quite possible that Boyer's *filaginis* is the migrant form of the poplar gall aphid of Lichtenstein.

Kaltenbach's *Gnaphalum* appears to be the same species.

P. lactucarius, Passerini.—On lettuce, July 24th, 1904, Wye. Wingless females and also winged females.

Genus SCHIZONEURA, Hartig.

Schizoneura corni, Fabricius.—On *Cornus sanguinea* near Wye; winged females appeared in abundance beneath the leaves on October 7th, and produced living young. Still breeding, October 17th, and very numerous.

Genus LACHNUS, Burmeister.

Lachnus tomentosus, De Geer.—Wye Downs, on Scots fir, August 20th, 1911, a colony of wingless females. Also sent me on September 10th, from Pitlochry, N.B., by Mr. Duffield. I have three other *Lachnus* which I cannot yet identify, all from Conifers.

Genus VACUNA, Heyden.

Vacuna dryophila, Westwood.—Wye, on oaks, July 4th, 1909. Winged and wingless females.

Genus RHIZOICUS, Passerini (RHIZOBIUS Burmeister).

Rhizoicus (*Rhizobius*) *graminis*, Buckton.—Roots of grasses, Paddock Wood, 1904, in winter.

* Lichtenstein (1886) places this as the type of his genus *Bucktonia*.

LEPIDOPTERA OF THE SWEDISH PROVINCES OF JEMTLAND AND LAPLAND.

By W. G. SHELDON, F.E.S.

(Continued from vol. xliv. p. 362.)

ABISKO is finely situated on the southern shores of the beautiful Torne Träske, at an elevation, according to Baedeker, of 1296 ft. The lake has a length of about sixty and a breadth of eight or nine kilometres, and is surrounded on all sides by mountains, which rise steeply out of it for a height of from 2000 to 5000 feet. The shores are covered for some 500 feet above its level with forest, composed chiefly of birch, with, however, a sprinkling of mountain ash and here and there an isolated pine, and there are large quantities of sallow of many species in the swampy ground. This forest consists of trees, which on the water's edge attain a height of twenty feet, and in sheltered positions, especially on the north side of the lake, thirty and even forty feet is reached. The undergrowth consists chiefly of *Vaccinium* of various species; here and there along the whole length are tracts bare of trees, and more or less swampy; and it is in these spots and on similar ones inland from the lake that the butterflies of the district are almost exclusively found. They have a growth of *Vaccinium* of four species, crowberry, dwarf sallow, dwarf birch, and many beautiful flowers, including *Andromeda polifolia*, *A. tetragona*, and the nearly allied *Phyllodoce cærulea*, *Dryas octopetala*, *Trientalis europæa*, *Silene acaulis*, *Astragalus alpinus*, saxifrages of several species, *Rhododendron lapponica*, *Azalea procumbens*, and many others; in fact, the flora is for so high a latitude a very rich one, and reminds one very strongly of that of the higher Alps, many species being common to both.

Naturally the "national park" greatly hampers one's proceedings—much of the most fruitful ground, and the whole of the most convenient, is included in it—and for this reason, although the district all round is a magnificent one, and would probably, if thoroughly hunted, produce nearly all of the species of Rhopalocera known to inhabit the Arctic regions of Scandinavia, I am compelled to advise entomologists and naturalists generally to give it a wide berth, at any rate for the present. In the course of time, as the country gets more developed, and there is a proper service of boats on the lake that would enable all parts of it to be worked, and huts are built in the mountains round, the case would be different. I should mention that the surroundings of the hotels of the Swedish Touring Club in other parts of the country have also been constituted national parks, and therefore the objections to Abisko as a resort for naturalists apply to them also. In time no doubt the drastic nature of the regula-

tions will be mitigated, for, judging from those I conversed with on the subject, they are exceedingly unpopular with the great majority of the Swedes themselves.

I had a very bad experience with the weather at Abisko during my stay from June 16th to July 18th. There was not much rain—the rainfall of Lapland is quite small, the average being only sixteen inches per annum—but the weather was cold and sunless throughout. During the whole of the time there were only two cloudless days—June 18th and July 12th; out of thirty-two days, eleven were absolutely sunless, and on many of the others the sun was very fugitive, and one could do but little. Up to the end of June the weather was passable, but after that date it got much worse, and during the last six days of my stay the sun did not appear at all. The temperature also was very low. There was a thermometer outside the hotel, from which, between July 6th and July 18th, I took the temperature daily at 8 a.m. and 2 p.m. The highest reading was $57^{\circ}2$ Fahrenheit at 2 p.m. on July 12th, and one day at that hour it did not exceed $42^{\circ}8$. The average at 8 a.m. was $48^{\circ}7$, and at 2 p.m. $50^{\circ}5$. The slight difference between the early morning and afternoon temperatures was accounted for by the sun being above the horizon during the whole twenty-four hours of the day. With these temperatures one wonders that butterflies would fly at all, but it did not seem to much matter how cold it was so long as the sun was shining: such as were out flew merrily. At the date on which I reached Abisko the season was apparently an early one, and species were well up to the expected dates; but of course the cold period put a stop to emergence or greatly delayed it, and specimens got fewer every day. One species found by Mr. Rowland-Brown I did not see, and others were evidently just emerging at the time of my departure. I had intended staying until the end of July, but the weather outlook was so hopeless at the middle of the month that I decided to get away, and the reports from other districts in the north being equally bad, it did not seem to be of use trying elsewhere.

Undoubtedly, 1911 in Arctic Europe was a very dull and cold summer; in southern Scandinavia as far north as Stockholm the weather was very hot and dry, but north of this line the reverse took place. I am informed that it is often the case that when in Britain we get a good summer, in Lapland it is cold and wet; and when it is cold with us it is usually a fine season in the north. 1910, for instance, which it will be remembered was one of the most inclement summers we have experienced for many years in Britain and Central Europe, in Lapland was singularly fine.

Of course the conditions I met with greatly governed the number of species and specimens found; in Jemtland I came across twelve species of *Rhopalocera*, and at Abisko sixteen

species, and an additional one at Narvik on my return home, which journey took me ten days, *via* the west coast, the beautiful Bergen and Christiania Railway, and the steamer from the latter place to Hull.

Of the species found by Mr. Rowland-Brown at Abisko I met with all except *Chrysophanus hippothoe* var. *steiberi*. I am informed from German sources that *Melitæa iduna* has been taken along the shores of the Torne Träske on the way to Björkleiden. I searched carefully and often for this species, but did not find it; and that *Brenthis polaris* and *B. frigga* are found on Nuolja, the mountain immediately at the back of the hotel. I saw in the National Collection at Stockholm an example of *B. frigga* var. *improba*, which was taken at Björkleiden, near the waterfall. I learn from Herr Max Bartel that *Colias hecla* var. *sulitelma* is found not infrequently on the north side of the lake above the tree line, in July. The best localities for collecting which I could find outside the park were: (1) the road leading through the forest from Abiskojokk to Björkleiden, and in the mountains round the latter place; (2) by taking the path alongside the Abiskojokk (right bank) for a mile or so until a marble quarry is reached, one comes to a series of swamps stretching eastward; some of these are certainly in the Park, some are just as certainly not, and some are doubtfully so; (3) probably the best ground of all is reached by walking along the railway, eastwards, past Abisko Station, and then following up the first brook one comes to, about a kilometre past the station. Along its course are some fine swamps, containing *Brenthis pales* var. *lapponica*, *B. aphirape* var. *ossianus*, and *B. freija*; higher up, towards the valley called the Lapp Porten, *Hesperia centaureæ* was commoner than I found it elsewhere in Lapland; on the sides of the Lapp Porten itself, *Eneis norna* and *O. bore* were not infrequent.

The birches, at the date of my arrival at Abisko, were quite brown; some trees had the leaves half developed, but in many instances the buds had not burst from the winter sheath. It was exceedingly interesting to watch them develop under the influence of the perpetual light, within one week all the trees were quite covered with full grown leaves. On dull days I spent my time chiefly in observing the birds of the district, which were very interesting to a Britisher. I suppose there must have been several hundreds of pairs of fieldfares breeding on the shores of the lake between Abiskojokk and Björkleiden, and of other British winter birds, redwings, bramblings, and mealy redpolls were very abundant on the same ground; quite half a dozen pairs of rough-legged buzzards had their eyries within a mile of the hotel. Of the Scandinavian mosquito one could say a good deal: they were everywhere, both in Jemtland and Lapland, and certainly most abundant in the former province;

probably the cold weather experienced at Abisko prevented many of them from emerging, or delayed their emergence until after my departure. For protection at night I had a small bell-shaped mosquito curtain, which was suspended by a brass hook to the wooden ceiling of my bedroom. I found this an efficient safeguard; without it I do not see how it would have been possible to sleep, at any rate with the window open. During the day it was absolutely necessary in warm weather to wear a veil and gloves. In spite of these precautions I got a good deal bitten; fortunately the mosquito in these regions does not have much foul matter to feed upon, and so far as I was concerned the inconvenience was only temporary. I saw, however, a number of people who were not so fortunate, and whose faces and hands were greatly swollen from the effects of their bites.

The species I met with are as follows:—

Pieris brassicae.—Flying about the gardens at Mattmar; of average size, with very pale tips to the front wings.

P. napi var. *bryoniae*.—Common at Abisko, and well out in both sexes at the time of my arrival there. The species was somewhat local, its occurrence being dependent apparently on the abundance of its usual food-plant in Lapland, *Arabis alpina*, which, except for a small *Draba* and a species of *Cardamines*, was the only Crucifer I saw. The butterfly was most abundant by the side of the road leading to Björkleiden. The females, all of which are var. *bryoniae*, are very variable; some have the spaces between the veins showing pronouncedly white, others are suffused over almost all the wing area with the grey shading, and a certain portion of both of these forms are ab. *sulphurea*. I had no difficulty in procuring as many ova as I required, most of which I sent to the late Mr. A. Harrison, who specialized in this species. Others I brought home have since pupated.

Colias nastes var. *werdandi*.—Abundant everywhere on swampy ground at Abisko, frequenting the drier parts of the swamps, and also certain banks where its food-plant, *Astragalus alpinus*, grows, and extending up the mountains to at least 1000 ft. above the lake. The species was well out in both sexes at the date of my arrival, June 17th, and certain examples were then wasted. There is no doubt but that in an average year it is out in the first few days of June, and probably at the end of May. By the end of June the majority were worn, and the species quite disappeared about July 7th. The male flies swiftly, with the usual *Colias* flight, searching for the female; it frequently rests on the ground, but rarely on flowers, the only flower favoured, so far as I saw, was *Silene acaulis*. The flight is so swift, and the ground frequented rough and in places swampy, it is better to lie in wait, and the butterfly can then be captured freely. The female flies much more slowly.

Of this species I brought home a very variable series of twenty-eight males and twenty-seven females. As I understand the named European aberrations, they are as follows:—

(i) A female form with ground colour of the wings pale sulphur, as in the male = ab. *sulphurea*, Lampa.

(ii) A form of both sexes with ochre-yellow wings = ab. *christiernssoni*, Lampa.

(iii) A male form with the black band of fore wings not pierced with lighter nervures, and without the dark submarginal band = ab. *immaculata*, Lampa.

My series contains three examples of ab. *sulphurea* and four examples of ab. *immaculata*, but it is entirely without ab. *christiernssoni*, of which there is a long series in the National Collection, labelled as from Lampa, and apparently taken at Kvikjock.

In addition to these forms, my series contains the following:—

(i) Males with the ground colour of both fore and hind wings of the same light yellow as that of the blotches in the border of the wings of typical examples of *C. phicomone* from the Alps = ab. *torneoensis*, n. ab. I have three specimens of this form.

(ii) Males of very pale yellow, almost white, of the tint of the typical female = ab. *pallida*, n. ab. I have two of this form.

(iii) Females with the light blotches in the dark margin of the front wings forming a continuous light band, except that the dark wing-nervures pass through it = *connexa*, n. ab. Of this form I have half a dozen examples.

(iv) Females with the light sulphur discoidal spot on the upper side of hind wings orange coloured = ab. *flavopunctata*, n. ab. I have one example of this form.

(v) Males and females with the discoidal spot on the under side of the hind wings wholly chestnut-brown and without the white centre that is found in the type = ab. *castanea-punctata*, n. ab. I have four of this aberration.

I succeeded in obtaining ova, both from captured females and by search, and despite the difficulties caused by the long journey home two of the larvæ have reached the last stage. The wing expanse of my largest males and females are respectively 50 mm. and 56 mm.

C. paleno var. *lapponica*.—Herr Sprongorts writes me that he saw two specimens near Åbisko station on July 22nd.*

(To be continued.)

BY THE WAY.

“On the 12th of December, at Holy Trinity Church, Upper Chelsea, by the Rev. E. M. Vaughan, vicar of Old Basford, assisted by the Rev. H. R. Gamble, vicar of the parish, and the Rev. E. G. Alderson, vicar of Stopsley, Sir John Robinson, of Worksop Manor, Notts, to Eveline Maude, elder daughter of Mrs. Alderson, Park House, Worksop.”—‘Morning Post.’ We hasten to congratulate Lady Robinson, who is so well known

* It certainly should occur here, though I never saw an example in the much more favourable and advanced season of 1906. Its food-plant, *Vaccinium*, grows everywhere.—(H. R.-B.)

amongst us as a thoroughly good and practical all-round British entomologist. We trust she will still be enabled to spare some of her leisure for the study of insects.

How far are the common or kitchen cockroaches become naturalised in Britain now? A lady writes in reference to a remark at p. 298, that she well knows at least three truly rural houses overrun by the beasts. The first, in Gloucestershire, stands some two hundred yards from any other, surrounded by fields, except the front which looks over drive and garden to a large wood with small field between; village beyond road and drive—quite too far for the insect to travel from the other houses; village very scattered, of about one thousand very poor souls, plus farmers. The second house, in the same county, is quite shut off from the village, has an entrance drive and shrubberies, but no house or buildings within one hundred yards. The third house, in Lincolnshire, is opposite the village church, with farm buildings and cottages around it; a population of not over four hundred. No store or warehouse was near any of the three. She suggests the importation in boxes of dry provisions from London, though owning none such occurred to her while in a Yorkshire country house; and we, who get such from the Army and Navy Stores, have no cockroaches in rural Suffolk.

Canada has given us more than one good lead lately, and we here tender her our sincerest jealousy, upon hearing the announcement that she is about to publish a detailed Catalogue of the whole of her insects. It has been our pet wish, since we began to attack all orders of British insects—not less than twenty years ago, be it softly said—that there were some sort of a general guide to the numbers occurring with us. The compilation of such figures is not the easy matter a one-order entomologist may presume. Who, for instance, can yet supplement Denny's obsolete account of the Philopteridæ or Anoplura; can Theobald yet count the Aphididæ or Bagnall our Thrips? This was the principal motive for our compilation of the Chalcididæ Catalogue; and the Proctotrypidæ have been touched only by Chitty since 1873. When working on the Victoria History, we attempted a general conspectus, which was roughly:—

Coleoptera	3264
Hemiptera	1233 (computing Anoplura at 211)
Orthoptera	53
Neuroptera (<i>s.l.</i>)...	443
Lepidoptera	2100 (total hard to come at!)
Hymenoptera.....	4830
Diptera	2577 (excl. italics in Ver. List)

14500

Two events of importance to our knowledge of the British fauna will, we trust, take place ere long. These are the completion of his very excellent account of the Sawflies by the Rev. F. D. Morice, and the publication by our highest authority upon Heteroptera, E. A. Butler, B.A., B.Sc., of his close investigations into the life-histories and metamorphoses of these most economically injurious insects, of which we are really very ignorant, considering their ubiquity. Douglas and Scott told us little of their earlier stages, because little was known in 1865; and Saunders in 1892 was deplorably tied down by his publishers.

The extent of sleeping-sickness is yet unknown. Bruce, Hamerton, and Bateman have some interesting observations in the Proc. Royal Soc., and find that the water-buck, bush-buck, and reed-buck can easily be infected with the human strain of this disease, *Trypanosoma gambiensis*, by the bite of the fateful *Glossina palpalis*. Subsequent investigation, however, failed to reveal a trace of the parasites in the antelopes' blood, yet, even more remarkably, the infected animals can transmit the parasite to clean flies, even as long as eighty-one days after the latest attack upon the host by an infected fly. The previously clean fly is, too, capable of passing the virus on to other hosts, so that these bucks, living in districts inhabited by *Glossina*, become potential reservoirs of sleeping-sickness. We anticipate that Mr. Newstead, who is now upon the spot, will find a large proportion of indigenous animals to carry the disease.

C. M.

NOTES AND OBSERVATIONS.

SPHINX CONVOLVULI REARED FROM THE EGG.—In the note sent for publication, on October 24th, I mentioned that I had reared *S. convolvuli* from ova to pupa (Entom. xlv. p. 407). I have now to record emergence of the moths. The pupæ were kept in a temperature of 75°, and on November 7th one imago appeared, another emerged on the 8th, followed by two imagines on the 19th.—G. NOBBS; North Lodge, E. Cowes, Isle of Wight.

CUCULLIA UMBRATICA REARED IN SEPTEMBER.—From ova obtained from a wild female of *Cucullia umbratica* in June of this year a number of the larvæ fed up and pupated in August, and it may be interesting to record that two specimens emerged during September. The other pupæ are going over as is usual.—T. ASHTON LOFTHOUSE; Linthorpe, Middlesbrough, December, 1911.

CYANIRIS ARGIOLUS AT READING.—This species was seen in the garden on May 7th last, and a recently emerged specimen was found on a leaf of holly.—H. L. DOLTON; 21, Brunswick Street, Reading.

ENDROMIS VERSICOLOR IN OCTOBER.—On October 17th, 1911, I found in my breeding cage a female *versicolor* which had pupated

near Aviemore in July, 1909. For two winters it has been subjected to a temperature of 90° to 140° F. and has finally emerged after exposure to cold air on frosty nights in October. This seems to be worthy of record as an unusual time of emergence.—CHARLES MELLOWS; Bootham School, York, November 2nd, 1911.

FORMALIN A REMEDY FOR MOULD ON CABINET SPECIMENS.—There is no doubt that the above is an excellent remedy for mould, but I would warn entomologists who may be tempted to use it that it is almost impossible to relax an insect that has at any time been subjected to it. I speak from bitter experience, as quite half a large collection of Lepidoptera brought home from the tropics was quite ruined, in spite of the skill and care exercised by an experienced setter.—N. MANDERS, Lieut.-Colonel; London.

ABNORMAL EMERGENCE OF *PIERIS RAPÆ*.—Yesterday afternoon (December 19th), when passing a greengrocer's shop here, I noticed a *Pieris rapæ* on the inside of the window. Entering the shop, I boxed the specimen, and found it to be a freshly emerged female of the spring form.—(Rev.) J. E. TARRAT; Fareham, Hants.

NOTES ON "MICRO" LEPIDOPTERA IN SOUTH DEVON.—In the course of a short visit to Paignton early in August, 1911, I took the following "Micros" near Paignton:—*Pyrausta aurata*, *P. purpuralis*, *Botrys asinalis*, *Pterophorus monodactylus*, *Crambus geniculeus*, *Tortrix unifasciana*, *Peronea sponsana*, *P. schalleriana*, *P. variegana*, *Eupécilia angustana*, *Depressaria arenella*, *D. subpropinqua*, *D. applanata*, *D. albipunctella*, and *Bryotropha terrella*, not a large list, certainly, but the weather was not conducive to much energy. Mr. E. A. Atmore has kindly helped to identify doubtful specimens. I was fortunate in capturing a good specimen of *Aventia flexula*, which flew out of a hedge I was beating.—G. W. MASON; Barton-on-Humber.

LEPIDOPTERA AT BURNLEY.—On June 6th I captured a specimen of *Cidaria silaceata*, which is new to our local list. On June 10th I took a male *Nemeophila plantaginis*, a species I had not seen here for several years. On August 26th *Celena haworthii* was fairly common on the moors, also a few *Polia chi*, but the season seems to have been a bad one for the latter here. By September 4th both *C. haworthii* and *P. chi* were very nearly over, while *Tapinostola fulva* was flying at dusk, and *Oporabia filigrammaria* was found on rocks and walls. According to previous dates all these moorland species were a fortnight earlier than usual.—W. G. CLUTTEN; 132, Coal Clough Lane, Burnley.

LEPIDOPTERA AND ODONATA IN SOUTH CORNWALL.—A list of Lepidoptera seen or taken during last August in the Penzance district may be of interest. With the exception of one dull rainy day, the whole period was fine and hot, with brilliant sunshine during the day-time. During the first half of the month attention was chiefly directed to the district of the Try Valley, lying midway between Penzance and Gurnard's Head. Of butterflies, *Lycæna alexis*, *Chrysophanus phlæas* (one nice dark specimen), *Epinephele tithonus*, *Pararge egeria*, *P. megæra*, and *Satyrus semele* were common, together with all three

Pierids and a few *Cænonympha pamphilus*. A fair sprinkling of *Pyrameis atalanta* was noticed on the flower-heads of *Eupatorium*, several *Vanessa urticae*, and one or two worn *Argynnis paphia*. No varieties of *E. tithonus* similar to the Millook specimens were noted. At sugar the following insects were observed: *Azylia putris*, *Luperina cæspitis*, *Leucania pallens*, *L. lithargyria*, *Acidalia marginepunctata* (*promutata*), *Rusina tenebrosa*, *Luperina testacea*, *Charaxes graminis* (abundant), *Plusia festucae*, *Triphæna ianthina*, *Noctua plecta* (abundant), *Agrotis saucia*, *A. segetum*, *A. suffusa*, *Plusia chrysitis*, *Gonoptera libatrix*, *Caradrina cubicularis*, *Noctua c-nigrum* (common), *Stilbia anomala* (one male), *Euplexia lucipara*, *Eupithecia jasideata* (two worn), *E. virgaureata* (3), *Hydræcia micacea*, *Calymnia affinis* and swarms of *Phlogophora meticulosa* and *Plusia gamma*. *Neuronia popularis* was a pest at light, flying punctually at 9.30 every evening. The dragonflies *Cordulegaster annulatus* and *C. virgo* were common along the course of the River Try. One of the former species hovering poised above the water was observed to fly *backwards* every now and then in small vertical arcs, having a versed sine of about six to nine inches. When performing this evolution the wings appeared to vibrate much more rapidly than during the forward flight; this particular specimen when captured was engaged in eating a small crambid moth (? *tristellus*). The latter half of the month was devoted to working the cliffs. A sprinkling of *Polia nigrocincta*, both male and female, turned up at sugar between 8 p.m. and 8.30 p.m. One *Bryophila perla* and *B. glandifera* at rest on rocks. Some half dozen larvæ of *Sesia muscifformis* (*philanthiformis*) were extracted from clumps of thrift, three larvæ being obtained from one plant. Curiously enough, the dwarf meagre plants did not appear to be tenanted, and many of them growing in chinks of rocks appeared to have succumbed to the heat. *Jasione montana* abounds in the district, and several larvæ of *Eupithecia jasideata* were taken from the seed heads. By far the largest number was met with inland, away from the cliffs. The larvæ of this species appear to move from one seed head to another in the evening, commencing about 7.30 in August, but this migration also seems to take place in the morning about 7, when there has been an early shower, and the seed heads of *Jasione* have become soaked. A tenanted or former tenanted seed head can be instantly detected by the "give" of the crown when taken between the finger and thumb. The larvæ varied considerably in colouring. Ivy blossom was all but out on August 30th. The temperature each evening about 8 o'clock varied between the limits of 68° F. and 75° F., the average humidity at the same time being 59.—G. B. KERSHAW; West Wickham, Kent.

NOTES ON LEPIDOPTERA IN THE PORCHESTER DISTRICT OF HANTS.—It might be of interest to record a few of the captures in this locality during the past summer, which has been an unusually good one for light, though sugar was completely useless till the second week in August. At light the most prominent were: *Smerinthus ocellatus*, June 3rd; *Phragmatobia fuliginosa*, July 30th; *Drepana hamula*, May 17th; *Notodonta dictæa*, May 18th; *N. trepida*, May 27th; *Drymonia chaonia*, May 17th; *D. dodonæa*,

May 31st; *Leucania straminea*, August 27th; *Nonagria geminipuncta*, July 29th; *Neuria saponaria*, June 29th; *Agrotis cinerea*, May 27th (this species was first observed to occur on Portsdown Hill by Mr. A. E. Bunas, of Portsmouth, who was fortunate enough to capture six specimens during this month); *Luperina caspitis*, August 27th; *Dianthæcia carpophaga* (the very pale form), June 13th, and again in August; *Cucullia lychnitis*, May 24th; *Plusia iota*, June 30th; *Acontia luctuosa*, July 28th; *Ennomos fuscantaria*, September 12th; *Geometra vernaria*, July 7th; *Emmelesia teniata*, August 5th; and *Lobophora viretata*, May 31st. More than one specimen of the majority of these was taken, though in each instance the earliest date of capture is given; I had a light burning in one of my upstairs windows throughout the summer, and over two hundred species were attracted.

During June the campion flowers (*Silene inflata*) growing on the hillside proved a prolific hunting-ground at dusk, *Leucania comma*, *Mamestra sordida*, *Agrotis corticea*, *Neuria saponaria*, *Dianthæcia capsicola*, *D. cucubali*, *D. conspersa*, *Hecatera serena*, *Hadena dentina*, *Cucullia umbratica*, *Plusia chrysitis*, and *P. iota*, all coming freely, whilst the large tract of forest-land around Southwick, on the far side of the hill, though only visited twice by day and three times at dusk, gave amongst others, *Argynnis euphrosyne* (including a remarkable black suffused variety), *Nemeobius lucina*, *Thecla rubi*, *Nemeophila plantaginis*, *Comacla senex*, *Cybosia mesonella*, *Drepana hamula*, *D. unguicula*, *Lophopteryx camelina* (in cop. on an oak-trunk), *Cymatophora duplaris*, *Leucania pudorina*, *Erastria fuscula*, *Toxocampa pastinum*, *Ellopiæ prosapiaria*, *Eurymene dolobraria*, *Pericullia syringaria*, *Epione advenaria*, *Boarmia lichenaria*, *Phorodesma pustulata*, and *Hydrelia sylvata*; also *Plusia pulchrina* at flowers of ragged robin (*Lychnis flos-cuculi*).

Sugar, as has before been stated, was a complete failure up till the second week in August, but between then and the first week in October over seventy species put in an appearance, including *Bryophila muralis*, *Nonagria lutosæ*, *Hydræcia paludis*, *H. micacea*, *Mamestra abjecta*, *Miana literosa*, *Caradrina ambigua*, *Dianthæcia cucubali*, *Hadena suasa*, *Xylina semibrunnea* (on September 16th), *Abrostola tripartita*, *Catocala nupta*, and several Geometers; as my "round" was confined to the limits of an ordinary "villa" garden, I was more than satisfied with the results.

Needless to say there was the usual multitude of things at dusk along the hedgerows during May, June and July, but these cannot be dealt with at length. *Charocampa porcellus* and *Acidalia emutaria* were possibly the surprise captures among the host that was netted every night. *Sphinx convolvuli* also made its appearance at odd places in the village in September.

The usual swarms of larvæ of *Triphæna fimbria*, *Aplecta nebulosa*, *Boarmia repandata*, &c., were to be beaten at night from the salallows in the spring, whilst by day those of *Arctia villica* were to be obtained by careful searching, sunning themselves on the rough herbage below the hedgerows in most of the lanes leading up on to the down.

On the whole the district would appear to be an exceedingly interesting one, and one that would well repay careful study of its

lepidopterous fauna, more especially if more time than I have at my disposal could be devoted to collecting in the earlier stages, when I have no doubt many more unexpected species would be brought to light.—LESLIE H. MOSSE ROBINSON; Margaret Villa, Porchester, Hants.

SECOND BROODS OF AGROTIS EXCLAMATIONIS, &c.—There are several notices in the 'Entomologist' for last year of second broods of this species, which some of the writers seem to think is an unusual occurrence. I have always considered it as a second-brood insect in this neighbourhood, and should be much surprised if I did not meet with it at sugar in August and September. It is generally very abundant, but this year was not as plentiful as usual, though some other double-brood species simply swarmed, and this was quite a feature of the past abnormal season. The moth which in point of numbers headed the list was *Leucania pallens*; it began to appear about the middle of August, and on the night of the 26th every sugared post was covered with them; there was a large proportion of the red variety amongst them, and a great many were remarkably small examples, one or two being the smallest I have ever met with, being only one inch in expanse of wing. The following were also very abundant, in the order they are named:—*N. c-nigrum*, *N. rubi*, and *A. puta*, and of other second-brood species, *A. segetum*, *N. plecta*, *P. metuculosa*, *H. suasa*, *H. chenopodii*, and *T. orbona* were fairly plentiful. *T. pronuba* was seen from early June until the end of September, and I fancy it is more or less continuously brooded throughout the summer. I also noticed a few each of *H. oleracea*, *M. brassicae*, and *A. psi*, and on September 7th one *A. rumicis*. The last-named is sometimes numerous in the autumn, and I have seen the larvæ late in October. Of Geometræ the most noteworthy was the abundance of *T. amataria*. On July 26th I found it in great numbers among broom on an old railway bank; this of course must have been a second brood. I did not note the date the first was captured, but it was some day towards the end of May. From August 23rd until the end of the month I bred about two dozen from ova laid by the July moths; this would be a third brood, and at the same time the moths were swarming in openings in woods where there was a strong growth of *Chenopodium*. I had a large number of larvæ from three or four different females, but most of these are hibernating. *A. emarginata* was more numerous than I have ever seen it, and was most abundant towards the end of July, at which date they were much worn—these I have no doubt were a second brood. Some ova were obtained, and the larvæ fed up rapidly, and were full grown by the beginning of September. The first moths emerged on the 21st of that month, and the last on October 17th—about forty were bred; these would be a third brood. *A. dimidiata* was also very plentiful. I have no note of the date the first was seen, but I obtained a few ova about the middle of July; the first moth appeared on August 21st, and the last September 21st; none of the larvæ attempted to hibernate. *A. incanata* was abundant throughout the summer. I fancy there is always a succession of broods of this little

species. The last was noticed on September 14th. *A. emutaria* was very scarce; it is much rarer here than formerly on account of the encroachments of the sea and the destruction of the sea-banks and contiguous marshes. I netted the first on July 4th, a male; trod up a female on the 8th of the same month, and obtained a small batch of ova which hatched on 22nd, and another female a few days after I took the first one, and got another laying. About half a dozen of the larvæ fed up rapidly, and the moths emerged the end of August, but the bulk of the larvæ are hybernating. Of other species of Geometræ the second broods of *C. ferrugata*, *C. unidentaria*, *E. pumilata*, and *E. oblongata* swarmed, and I found the larvæ of the last in great abundance upon chamomile when I was sweeping for larvæ of *C. chamomillæ* on July 6th.—GERVASE F. MATHEW; Lee House, Dovercourt, December 18th, 1911.

BUTTERFLY NOTES FROM HEIDELBERG.—From July 14th until August 3rd, 1911, I was on a visit to Heidelberg, and, although not systematically working the district, the following notes on the butterflies met with may be of some interest. During the whole period the weather was intensely hot; the shade temperature in the town on more than one occasion rose to over 100° F., and the sun shone brilliantly every day. The collecting grounds may be roughly classified thus:—(1) The forest-covered hills on both sides of the Neckar, including on the left bank the Königstuhl (1865 ft.), the Geisberg (1230 ft.), with the small intervening valley, the Klingenteich, running down to the town; on the right bank the Heiligenberg (1455 ft.). These hills are clothed with beech, chestnut, and pine woods, with some oak and other forest trees. There is practically no open land. On the lower slopes on the Heiligenberg are some vineyards and many fruit orchards. (2) The lower lying ground between the woods and the banks of the Neckar, extending up the river valley. This land is cultivated and grass land. (3) The level cultivated land of the Rhine plain beyond the mouth of the Neckar Valley. Arriving late in the afternoon, I found the garden of the hotel swarming with *Pararge egeria*, its markings being well defined and light in colour. Subsequent experience showed that this species far outnumbered any other butterfly seen. It was everywhere—in town, woods, gardens, hills, and valleys—and could not be got away from. In one lane, where some fruit had fallen, it swarmed so much that the insects were jostling one another to get at the rotten fruit. *Pieris brassicæ* was abundant generally, but *napi* was the predominant white, chiefly of a richly marked form. Although many "whites" were netted on suspicion and released, I am not sure that I actually identified a single *nape*; at any rate, they were relatively rare. In the gardens also *Polygonia c-album* was the characteristic Vanessid. It looked very brilliant in the sunshine, but evidently a little *passé*, as it was difficult to get perfect specimens. *Gonepteryx rhamni* occurred generally, more common in some of the woods, but most in the plain, especially where clover or vetch was cultivated. An occasional *V. io* appeared in the garden.

Visits to the Heiligenberg on July 17th and 18th were interesting. In the woods at lower levels a few *E. hyperanthus* were met with,

but was not common, possibly over. *Cyaniris argiolus* about some ivy. *Chrysophanus phlæas*, *H. sylvanus*, *P. egeria*, everywhere, even in the darkness of the pine woods. *P. c-album* here and there, but more common within easy distance of orchards and gardens. At the summit of the Heiligenberg is the ruin of St. Michael's basilikon, forming a small space in the otherwise dense woods. This space formed a sort of sun bath for the insects from the surrounding woods to enjoy themselves in, and in an hour or so spent here most of the species could be reviewed. *Papilio machaon* in fresh condition dived down from the tree tops at one end and traversed the open space low down, rising again at the other end to depart over the ruined tower. A single *L. sinapis* was taken here. *Zephyrus quercus* came from the trees and flew about the ruins. *P. megæra* also on the walls. One or two *Epinephle ianira* occurred near here, but altogether I saw very few in the whole district. From the top of the view tower it was an interesting sight to watch with a field glass the numerous specimens of *P. machaon* flying about and resting on the tops of the chestnut trees. (A fine full fed larva of *Deilephila euphorbie* was picked up crossing a forest path.)

A visit to the Geisberg on July 22nd added *Argynnis paphia* to the list, also *Satyrus semele* and *Vanessa urticae*. (*Psilura monacha* common on tree-trunks in pine woods.) On the same afternoon, while in the churchyard at the old town of Dilsberg, a fine male *Apatura iris* floated in front of me, and in the valley at Neckarsteinach *Araschnia levana* turned up, also several *Thecla*s and "blues," but having no net handy I was unable to take them for identification. A single *Colias hyale* was subsequently taken on the river bank.

On July 24th I explored the cultivated land of the Rhine plain beyond Neuenheim. Here one had the rough cart roads between the orchards and patches of corn, clover, &c.; also railway banks, the banks of the Neckar, and a few dyke or drain sides. Certain butterflies were very numerous, especially on the clover or vetch. These patches were alive with, roughly in order, *P. napi*, *P. brassicae*, *G. rhamni*, *C. hyale*, of which a good series was soon obtained in perfect condition. An occasional *Vanessa urticae*, and *V. io*. Also about the banks and roads were taken *P. machaon*, *P. megæra*, *P. egeria*, *H. sylvanus*, *H. linea*, *L. alexis*, and an occasional *C. pamphilus*. On this date *V. antiopa* was first seen.

July 26th, over the Heiligenberg to the valley of Siebernmuhlen. Several *V. antiopa* in fine fresh condition were noted, and *V. io* and *V. urticae* getting more common. In one spot where the wood had been partially cleared *L. sinapis* was found abundant and frosh. *Egeria* still common, but getting shabby. *Megæra* increasing. *Lycæna argiades* taken on a rough bank by the roadside.

July 27th *P. mæra* appeared in the hotel garden, and was soon common in various localities, in company with the now abundant *P. megæra*.

On July 28th, and other occasions, the Klingenteich valley behind the town was visited: a small, partially open spot a little below the Molkenkur was found an excellent hunting ground. Besides many species already mentioned, *Zephyrus betulae* was taken, and several

A. levana (*prorsa*). It was almost pathetic to watch the insects trying to get some moisture out of dried-up stream beds. In one spot near here there had been a slight leakage from a water-pipe by the roadside, causing a moist patch in the dust. Here assembled were three *V. antiopa*, some other common butterflies, and possibly thousands of small and large dipterous and other thirsty insects. *V. atalanta* appeared on July 29, and *antiopa* was now common. On the Königstuhl, near the Kohlhof, a solitary *A. latonia* was netted, and walking thence to Neckargemund, many species were found common. From Neckargemund along the low-lying land bordering the Neckar as far as Schlierbach are several favourable spots for collecting, but owing to the drought the grass land was so scorched that no doubt conditions were not so favourable. A visit earlier in the season would be more productive of Lycanidæ, &c. The usual clover insects were seen, also *P. machaon*. *L. dorilis* was netted, and also *P. semargus*. I had no other opportunity of returning to this rather promising locality. I find that my total list of butterflies taken or noted amounts to thirty-two, and this no doubt might have been extended considerably by further exploration and information as to localities. My collecting was limited to what could be done during morning walks in the near neighbourhood, and as it was almost my first experience of Continental butterfly hunting, it proved of much interest to me. There may be some readers of similar limited experience whom these rough notes may interest.—E. OCTAVIUS CROFT, M.D., F.E.S.; 28, Clarendon Road, Leeds, August 31st, 1911.

COLLECTING IN NORTH DEVON IN 1909–1910.—Having had the privilege of spending some short holidays at an out-of-the-way spot in North Devon, some notes of my captures may be of interest. My first visit in 1909 only extended over three days, May 29th, 30th, and 31st, but the weather being fairly propitious, the following species were taken or noticed:—*Eupithecia pulchellata*, *Camptogramma fluviata* (taken after a rain-storm at 3 p.m. at rest on flowers of *Anthyllis vulneraria* growing on the cliffs on the shore). I believe this species is very seldom found in the perfect state. *Scricoris littoralis* flying amongst *Statice armeria*, *Pyrodes rheduellæ* flying in the morning sunshine over hawthorn, *Phalonia* (*Eupæcilia*) *atricapitana* amongst ragwort (*Senecio jacobææ*), *Adela fibulella* sunning itself on the flowers of the germander speedwell (*Veronica chamædrys*), *Chrysoclista aurifrontella*, *Lampronia luzella* (on the wing at 11 a.m.) and several larvæ of *Lasiocampa quercus* feeding on bramble in the hedgerows, and also larvæ of *Ebulea crocealis* on the leaves of *Inula dysenterica*. Quite a feature of the said hedgerows were the flowers of the red robin or campion (*Lychnis diurna*), which I had never previously seen so brilliant or luxuriant. My second visit in the same year extended from July 27th until August 14th. In the morning of July 28th on some rough ground above the cliffs I took *Aristotelia* (*Monochroa*) *tenebrella*, *Satyrus semele*, *Acalla holmiana*, and *Epiblema trigeminana*, whilst in the afternoon in a typical Devonshire lane I netted one *Lampronia luzella* (presumably a double-brooded species) flying in the sunshine, and beat one *Lithosia complanula* out of a hawthorn hedge. In the evening amongst rag-

wort on the sandhills, two worn specimens of *Cydia nigromaculana* were taken at dusk. The next day my exertions were rewarded with *Euxanthis zægana*, *Pyrausta stachydalis* (disturbed at mid-day from a mass of tangled herbage including bracken, *Stachys sylvatica*, &c., growing at the back of the sandhills), *Notarcha ruralis*, *Alucita lithodactyla* at rest on a flower of *Inula dysenterica* and *Recurvaria* (*Brachycrossata*) *cinerella* amongst grass on the sandhills. On July 30th, in the lanes near the sea, *Phalonia rupicola* was taken on the hedge near *Eupatorium cannabinum*; *Notocelia roborana* and *Epiblema trigeminana* were beaten out; and on the sandhills amongst ragwort I netted *Phalonia atricapitana* and several *Coleophora laripennella*; amongst heather a male *Plebeius argus* (*ægon*), *Peronea aspersana*, and *Pseudopanthera obscuraria*; and amongst marram grass *Gelechia politella* and *G. marmorea*. On July 31st, in one of the aforesaid lanes bordered with furze bushes on one side and blackthorn on the other, two fresh specimens of *Phalonia* (*Argyrolepis*) *badiana* were boxed as they sat on the furze in the afternoon between 3 and 4 p.m. Subsequent search revealed the food-plant *Arctia lappa* in an adjoining meadow. Another specimen of *P. badiana* was netted at 8 p.m. in a lane near by. Other captures that day were *Hydriomena decolorata*, *Orneodes hexadactyla* (*polydactyla*), *Euxanthis* (*Xanthosetia*) *zægana*, *Eurhodope* (*Rhodophæa*) *advenella*, *Acalla* (*Dictyopteryx*) *holmiana*, and *Epiblema* (*Ephippiphora*) *trigeminana*. The morning of August 1st was wet, but the heavy downpour ceased about 1 p.m., and by 2 p.m. the sun was struggling to shine through the mist. A female *Lasiocampa quercus*, newly emerged in a cardboard box covered with lino, being placed in the window of a front room overlooking the sandhills, attracted several males, of which ten were taken either in the room or just outside the window. In the evening between 9 and 10, at flowers of ragwort, *Agrotis tritici* (variable), *Triphæna interjecta*, *Caradrina alsines* and *Leucania pallens* were secured. Other species observed included *Catoptria cana* and *Gelectria domestica*. On August 2nd in the lanes about a mile inland the beating stick dislodged *Hydriomena* (*Melanippe*) *unangulata*, *H. dotata* (*pyralata*), *P. badiana*, *Euprecilia roseana*, *Stigmonota compositella*, *A. holmiana*, and *E. trigeminana*, and in the evening, *Brachmia gerronella* and *Idiographus inopiana* (flying low just before 9 p.m. amongst *Inula dysenterica*).

August 3rd produced several specimens of *Acalla holmiana* (beaten from blackthorn bushes at the back of the sandhills), *Euchelia jacobæ*, *Lampronia luzella*, *H. uangulata*, *Depressaria purpurea*, *Crambus perlellus*, *Blabophanes ferruginella*, *Symmoca* (*Ecogenia*) *quadrifuncta*, *Coleophora laripennella*, and *Lithocolletis fagimella*. The next day *Anthrocera filipendule*, *A. holmiana*, *Stigmonota compositella*, and *Gracilaria tringipennella* amongst ribwort plantain (*Plantago lanceolata*) were taken. The only capture of note on August 5th was *Stenia punctalis*—six specimens of which were secured on the cliffs at sunset. The next day three *Tinea argentimaculella* were taken flying at about 6 p.m. over an old wall about a mile from the coast, whilst a little further on at the roadside *Coleophora discordella* was netted.

August 7th was one of the hottest days of the year, and a visit to the sandhills resulted in the capture of *Crambus uliginosellus* (disturbed from the clumps of tall rushes), *C. tristellus*, one *Anthrocera filipendula* var. with a pink hind wing, *Peronea aspersana*, *Phalonia roseana*, *P. atricapitana*, *Sciaphila conspersana*, *Tortrix ictericana*, and *Symmoca* (*Ecogenia*) *quadripuncta* on the wall inside the light-house. On August 8th in the evening I took *Sericoris littoralis* amongst *Statice armeria* on the cliffs. I visited the sandhills again on the 9th at dusk and took *Alucita lithodactyla*, *Crambus uliginosellus*, *Phalonia* (*Eupæcilia*) *atricapitana*, *Depressaria alstromeriana*, and *Acrolepia granitella*. *Dicrorampha simpliciana* was flying freely amongst *Artemisia vulgaris* at 8 p.m. on the 10th and a good series was soon boxed, and earlier in the day *Ennychia cingulalis*, *C. nigromaculana*, and *Ecophora lambdella* were the best species obtained. The only new species noticed on the 11th was *Depressaria subpropinquella*. On the 12th a further visit to the sandhills only produced *Crambus geniculeus* in addition to those species already mentioned. As we were leaving the next day, the 13th was devoted to setting my captures and packing up. After doing so a final walk round the cliffs added *Acidalia marginipuncta* and *Adactylus* (*Aydistis*) *bennetti* to my list. The latter was flying between 8 and 9 p.m. amongst the spatulate sea lavender (*Statice binervosa*). It was very much paler than specimens from Mr. Ovenden, of Rochester, and appeared to be the form described by Mr. Tutt (vol. v. p. 137) as (2) Whitish grey with four black dots on the disc = ab. *grisea typica*, n. ab. This species does not appear to have been previously recorded for Devon. We had no rain after August 1st, the weather being brilliantly fine during the remainder of our visit. In 1910 I was prevented from visiting the neighbourhood until July 29th, and between that date and my return home on August 12th, the following species were taken, in addition to most of those already mentioned:—*Hypermercia angustana*, *Gelechia domestica*, *Butalis grandipennis* (on the road below a bank where some dwarf furze bushes grew), *Hedya aceriana* (at rest on white poplar trees and fences in a garden), *Argyresthia albistria*, *Lita maculea* (beaten from hedge in a lane), *Coleophora alcyonipennella* (brought into the house amongst knapweed flowers), *Eupithecia coronata*, *Phalonia rupicola*, *Cerosoma vittella*, *Laverna atra*, *L. ochraceella*, *Stymonota compositella*, *Chrosis alcella*, *Lithosia complanula*, *Prays curtisellus*, *Argyresthia andereggella*, *Peronea variegana*, *Catoptria ulicelana*, *Lithocolletis emberizipennella*, *Anerastia lotella*, *Selenia bilunaria*, *P. obscuraria*, *Eubolia bipunctaria*, *Depressaria nanatella*, *D. vpylana*, *Homocosoma sinuella*, *Ochsenheimeria birdella* (on bedroom window curtain at 7.30 p.m., a very unusual time and place for this species), *Penthina gentiana* (on the wing at 1 p.m. amongst teasle), *Orthotenia ericetana* (in a clover field in the afternoon), *Mimæsioptilus bipunctidactyla*, *Miana lterosa* (at ragwort flowers at 7 p.m.), *Spilonota incarnatana* (sitting on the leaves of *Rosa spinosissima* at sunset), *Coleophora albitarsella* (at rest on a fern leaf in a hedge in the afternoon), *C. laricella*, *Crambus inquinatellus*, *Xylophasia rurea*, *Miana bicoloria*, *Gelechia desertella*, *G. marmorea*, *Argyresthia spinella*,

Eucosoma (Catoptria) scopoliana, *E. fulvana*, *E. expallidana*, *Elachista atricommella*, *E. nigrella*, and *E. subnigrella*. The weather was most unfavourable, rough winds and rain prevailing most of the time. In fact August 10th was the only day during the fortnight free from rain: it was brilliantly fine, and about the hottest day experienced during a very disappointing summer. In conclusion, my grateful thanks are due to Mr. Edward Meyrick, F.E.S., for his kindness in identifying many of the species.—C. GRANVILLE CLUTTEBUCK, F.E.S.; Heathside, Heathville Road, Gloucestershire, November 13th, 1911.

ERRATUM.—Entom. xlv. p. 381, 18th line from top, read: to the posterior surface of the mesothorax, instead of posterior centre of the anal segment, in next line.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, October 18th, 1911.—The Rev. F. D. Morico, President, in the chair.—The following gentlemen were elected Fellows of the Society:—Mr. Sidney Howard Cotton, 1A, Chesterfield Street, Mayfair; Captain J. J. Jacobs, R.E., 2, Southport Street, Gibraltar; Mr. Kunui Khunan, M.A., Assistant Entomologist to the Government of Mysore, Bangalore, South India; Dr. Ivan Clarkson Maclean, M.D., B.Sc., M.R.C.S., L.R.C.P., 28, Hill Street, Knightsbridge, S.W.; Mr. Frank Taylor, The Technological Museum, Sydney, New South Wales.—Dr. F. A. Dixey exhibited a pair of each of the following species:—*Tachyris melana*, Fabr., *T. celestina* and *Catophaga ega*, Boisd., and remarked that Fabricius's type was preserved in the Banksian Cabinet, where it may still be seen, and that Mr. G. A. Waterhouse has now sent home specimens which are undoubtedly of the species described by Fabricius and represented by Donovan, which is not a *Catophaga* allied to *ega* or *paulina*, but a *Tachyris* belonging to the group which contains *T. celestina* and *T. nero*.—Mr. W. G. Sheldon, a living larva of *Colias nastes* var. *verdandi* which he had bred from an ovum deposited by a female captured at Abisko, in Swedish Lapland; the natural food-plant is *Astragalus alpinus*, L., but in captivity the larva fed upon white clover.—Mr. W. J. Lucas, two specimens of *Nemoptera bipennis*, Illig. (*lusitanica*, Leach), taken by Mr. A. H. Jones; one in the cork woods at Almorima, Spain, on May 5th, 1911, and the other at Linea, Gibraltar, on the 28th; also a specimen of *Lertha barbara*, Klug. taken by Mr. H. Powell at Aflou, Oran, Algeria, on June 30th, 1911. Mr. Lucas also exhibited a large specimen of *Sirex noctilio*, taken by himself at Leith Hill, Surrey, walking on the road, on September 8th, 1911.—Mr. H. St. J. Donisthorpe, a species of *Coloptera* new to Britain, *Lesteva luctuosa*, Fauvel, which he had taken in moss in a waterfall on the high ground in the Isle of Eigg, near Mull, on September 17th, 1911.—Mr. H. M. Edolsten showed some bred specimens of *Erastria venustula*; the larvæ had fed readily on flowers of *Potentilla tormentilla*, and on garden forms of *Potentilla*,

strawberry, and bramble blossoms, and later on lettuce leaves, which they seemed to prefer. They pupated below the surface of the ground in a strong cocoon.—Mr. K. G. Blair exhibited a male and two females of a "stick-insect" (? *Lonchodes* sp.), which is usually parthenogenetic. Mr. C. O. Waterhouse said he had bred three generations of this Phasmid and had had many hundreds of specimens, and he congratulated Mr. Blair on having the only male he had ever seen or heard of.—Dr. K. Jordan exhibited forty-six forms of *Delias* from three mountain-ranges of New Guinea. Whereas in other districts of the Oriental Region at the most seven or eight species (generally four to six) may be found in any locality, a surprising number are met with in the mountains of New Guinea from 3000 or 4000 ft. upwards. In suitable localities of the Owen Stanley Range no fewer than twenty-four species have been obtained, of which eighteen are confined to the higher altitudes.—The Rev. A. Miles Moss, the following Sphingids from Para:—*Amphimæa walkeri*, *Isoqnathus excelsior*, *Grammodia caesus*, with pupa spun up in a leaf; *Hemeropterus innuus*, *Epistore gorgon*, male and female; *Pholus phorbis*, *Xylophanes nehaus*, with chrysalis, and *X. cosmius*, female, the first known specimen of this sex.—The President mentioned that the University of Cambridge had decided to appoint a Demonstrator in Medical Entomology.

Wednesday, November 1st.—The Rev. F. D. Morice, M.A., President, announced that the Council proposed Fr. Eric Wasmann, of Valkenburg, Holland, as Honorary Fellow in the place of the late Herr P. C. T. Snellen, of Rotterdam, and Prof. J. H. Comstock, of Cornell University, U.S.A., for the vacancy caused by the death of Dr. S. H. Scudder, of Cambridge, Massachusetts, both of whom were then elected. The following gentlemen were elected Fellows of the Society:—Messrs. T. J. Anderson, Teaninich, Craig Millar, Midlothian; Edward Bernard Ashby, 33, Park Road, Whitton, Middlesex; W. A. Lambourn, M.R.C.S., L.R.C.P., Omi Camp, Lagos, West Africa; J. Jackson Mounsey, 24, Glencairn Crescent, Edinburgh.—Dr. Nicholson showed a specimen of *Aleochara discipennis*, Muls. and Rey, taken in the early part of this year from moss in a small wood at Alphington, Devon.—Mr. J. R. le B. Tomlin, a teratological specimen of the rare beetle *Triarthron maerkeli*, swept in the Wellington College district this summer. It has the two last joints of left antenna completely soldered together, making a two-jointed instead of a three-jointed club. Also a specimen of *Longitarsus melanocephalus* (?) taken by Mr. J. Collins at Oxford, with legs and tarsi remarkably thickened.—Mr. W. J. Lucas, five specimens, three males and two females, of *Panorpa germanica*, taken by Col. Yerbury, four at Dingwall in May and one at Lochinver in July. One male is practically immaculate, and the other two nearly so; the female from Dingwall is sparsely spotted, while the one from Lochinver is more nearly normal.—Mr. C. J. Gahan, a living specimen of *Aspidomorpha silacea*, Boh., an African species of Cassididæ, which had been sent by Mr. G. St. John Mildmay from Nyali in British East Africa on October 7th, reaching London on October 28th.—Dr. K. Jordan announced that the Polyteteniidæ contained in the collection of the British Museum, which are parasitic on bats in the

tropics, are viviparous like the parasitic Orthopteron *Hemimerus*. The young are born at a very advanced stage, but yet differ considerably from the adult. Two of the forms (*spasmæ* and *talpa*) described as distinct species, and lately placed in two different genera, are immature and adult examples of the same species.—Mr. Harwood exhibited two specimens of *Micrurula melanocephala* taken near Bishop's Stortford by sweeping in the evening, which he believed to be var. *brunnea*, Hoer; also two specimens of *Ocyptus cyaneus* taken by Mr. W. H. Harwood at Colchester, one in May and the other in June of this year, the first specimens taken in the district for nineteen years; also a species of *Coccinella* taken in a case of Tasmanian apples at Colchester.—Mr. H. Eltringham, specimens of African *Acræas*, to show that wide differences of colour and pattern may occur in a single species, and, conversely, that certain species which can scarcely be distinguished by their outward appearance are nevertheless very distinct, as shown by the structure of the male armature. Several new species and forms were also shown, including *A. lofua*, Eltr., male and female; *A. grosveneri*, Eltr., male; *A. aureola*, Eltr., male; *A. ella*, Eltr., male; *A. cinerea* subsp. *albertaina*, Eltr., male; *A. periphanes* f. *acritoides*, Eltr., male; and *A. astrigera* f. *brunnea*, Eltr., male and female. Dr. Jordan remarked on the extreme variability of the genus and its allies, geographically, individually, and even in the characters of the genitalia.—Mr. Bethune-Baker remarked on the unreliability of the genitalia in certain *Lycænidæ*.—The President stated that the male genitalia were, as a rule, reliable in the *Aculeata*, but in the *Tenthredinidæ* the male genitalia were quite useless for specific determination, though the females afford excellent characters.—The Hon. Walter Rothschild remarked on the identity of the male genitalia in certain distinct species of *Macroglossinæ*.—Com. Walker read a paper on "The Effect of Temperature on Animal (especially Insect) Life," by A. G. Butler, Ph.D., F.L.S.—The following papers were also communicated:—"Parthogenesis in Worker Ants, with special Reference to two Colonies of *Lasius niger*, Linn.," by W. C. Crawley, B.A.; "A Monograph of the genus *Acræa*," by H. Eltringham, M.A., F.Z.S.—GEORGE WHEELER, M.A., Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 12th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. H. R. Sweeting, M.A., of S. Woodford, was elected a member.—Mr. W. J. Kaye exhibited bred and captured series of *Lithosia deplana*, in which some of the former were much darker than usual.—Mr. Barrett, three series, one taken many years ago, one in 1909, and one this year; the 1909 were generally darker in colour but not so dark as Mr. Kaye's bred specimens, although several specimens were without the yellow costa of the fore wings.—Mr. Barrett, also a *Xylina furcifera* (*conformis*) taken in 1904 in the east of England, and an example bred in S. Wales in 1876, by Evan John. The latter was var. *suffusa*, Tutt.—Mr. Sich, specimens of *Gracilaria syringella* bred from *Phillyrea media*, a food-plant not hitherto recorded.—Mr. R. Adkin, an example of *Tortrix podana* bred on September 13th from a pupa taken in a shoot of *Euonymus* at

Eastbourne, and reported that the Rev. W. Claxton had reared several specimens in mid-September.—Mr. B. H. Smith, a specimen of *Sterrhia sacraria*, female, taken by him just recently near the Lizard, and a *Rumicia phleas* with right fore wing ab. *schmidtii*.—Mr. Dods, the huge cocoons of *Philosamia cecropia*, all of which had become dark brown in colour except one which had kept its pure white colour.—Mr. Main said that the grub shown in the Coquillo nut exhibited at last meeting was that of the large "pea weevil," *Caryoborus nuctuorum*, a native of Brazil.—Mr. Blair, specimens of *Boreas hiemalis* from Stanmore Common, in Essex.—Mr. Blenkarn, many species of Coleoptera taken by him during the season, including *Chytus arctis*, *Cicindela sylvatica*, *Dytiscus marginalis*, *Aromia moschata*, &c.—Mr. Adkin and others gave their experiences of the season.

October 26th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—The Rev. George Wheeler, M.A., F.Z.S., F.E.S., and Mr. H. B. Wells were elected members.—Mr. Sich exhibited *Lithocolletis hortella* and *L. sylvella*, and noted their specific characters and markings.—Mr. Russell, a *Phryxus livornica* from Purley, three autumn bred specimens of *Diacrisia sanno* (*russula*) from Grange over Sands, and recorded a *Bithys quercus* taken on September 1st.—Mr. R. Adkin, a series of *Eupithecia subfulvata* bred from ova laid by a female taken at Chiswick.—Mr. Moore, a large *Cicada* taken on a window at Wanstead, and read notes on a Silphid beetle from the Orange River Colony, which in life bore an abundant waxy secretion on its elytra.—Mr. Sheldon, a long and fine series of *Cobias nastes* var. *verlandi* taken by him in Lapland.—Mr. Newman, a long and varied series of bred *Amorpha populi*, with three second-brood examples.—Mr. Blair, living male and female specimens of the "stick" insect known as *Dixippus morosus*, and imagoes of the rare Dipteron *Boreas hiemalis*.—Mr. Baumann, a fine melanic form of *Acidulna virgularia* from Lewisham.—Mr. Curwen, series of *Cobias palæno*, *C. phicomone*, *C. hyale*, and *C. edusa* from the Swiss Alps, and also melanic forms of *Cidaria immanata*, *Hypsipetes sordidata*, and *Mania maura*.—Mr. Blenkarn, examples of three species of Coleoptera recently recognised as British, viz., *Halplus heydeni*, *H. immaculata*, and *Gabrus stipes*, from the Cotswolds, Lowestoft, and Beckenham, respectively.—Mr. Buckstone, a very remarkable *Brenthis selene* from Wanborough, with almost all the usual markings absent on the upper side.

November 9th, 1911.—Mr. W. J. Kaye, F.E.S., President, in the chair.—Mr. H. Page, F.E.S., of New Cross, and Mr. W. S. Coxhead, of Clapton, were elected members.—Mr. South, on behalf of the Rev. A. P. Waller, exhibited a series of *Leucania* reared from ova laid by a female *favicolor*, half of which were distinctly *L. pallens*, the rest agreed with the parent or were intermediate, and numerous captured examples for comparison; also three specimens selected from thirty *favicolor* that were reared from ova deposited by a *pallens*-like female.—Mr. Newman, a long series of *Pyrameis cardui* bred from ova and fed up in a hothouse. The female was captured at Folkestone, on September 2nd, and the last imago appeared on October 16th.—Mr. Kaye, bred specimens of *Rumicia phleas*, forced in a hot-

house from ova.—Mr. Andrews, the local Diptera *Syrphus vittiger*, *S. lineola*, and *Sciomyza simplex* from North Kent.—Mr. Adkin, specimens of *Peronea varieyana* taken in or reared from his own garden, including a second-brood example on October 6th.—Mr. Tonge and Mr. Colthrup, series and specimens of *Xylina socia* (*petrificata*) and *X. semibrunnea* for comparison. One specimen of the latter species was from the New Forest.—Mr. Moore, specimens of the Tsetse Flies (*Glossina*) from the Lake Chad area, and read notes on them.—Mr. Buckstone, series of *Brenthis selene* from Surrey, one small and dark from high ground, gravel overlying chalk, mainly in July, the other large and light on low marshy ground clay, mainly in June.—Mr. Carr, a large number of Lepidoptera taken in Shropshire during 1910.—Mr. Sich, specimens of *Lithocolletis stettinensis* from Oxshott.—Mr. Tonge, lantern slides of imagines shortly after emergence of species of the genus *Ægeria* (*Sesia*), and also the ova.—Mr. J. P. Barrett, lantern slides of collecting grounds around Mount Etna.—Mr. Main, lantern slides showing details of the life-history and economy of a common millepede.

November 23rd.—Annual Exhibition of Varieties, &c.—The Rev. F. D. Morice, M.A., F.E.S., was elected a member.—Mr. South exhibited an extreme melanic aberration of *Brenthis selene*, a dark-banded *Zonosoma linearia*, *Rumicia phleas* var. *eleus*, *R. phleas* var. *schmidtii*, a fine series of varieties of *Leptogramma literana*, &c.—Mr. R. Adkin, two series of aberrations of *Abraxas grossulariata*, (a) from wild larvæ, (b) from inbreeding, a *Zonosoma orbicularia* with the whole of the wings of a rich red-brown, &c.—Mr. Blenkarn, varied series of *Amorpha populi* and *Bupalus piniaria*, and a *Brenthis selene* almost devoid of transverse markings.—Mr. Newnan, a series of *Mellinia ocellaris*, including the forms similar to *M. gilvago* and *Citra fulvago*, a large number of the more striking varieties from the "Capper" collection, a lemon-tipped ab. of *Euchloë cardamines*, a *Brenthis euphrosyne* with black hind wings, a *Pyrameis cardui* with apex of fore wings largely black, fine abs. of *Agraulis coridon*, &c.—Mr. A. Quarrington, *P. cardui* with conspicuous blue spots, a yellow *Polygonia c-album*, *A. corydon*, with large confluent spots, *R. phleas* with almost obsolete marginal bands, &c.—Mr. Bright, a drawer containing all the finest extreme varieties from the collection of the late Mr. J. A. Clarke, and a drawer of varieties of *Amorpha populi*, including a magnificent gynandromorph.—Mr. Turner, a series of *Erebia aethiops* from Scotch (var. *caledonia*) and many Continental localities, a long series of *Luperina nickerlii*, including a fine series of the *gueneei* race from Mr. Baxter (St. Anne's-on-Sea), a set of the E. Pyrenean race *graslini* from M. Oberthur, and the type form Bohemia, many forms of *L. testacea* kindly sent him by the same gentleman, from France and Algeria, together with a number of *L. dumerilii* from the same localities.—Mr. Main, long and fine series of *Boarmia repandata* bred by the late Mr. Harrison and himself, the results of crossing the dark and *conversaria* forms.—The Rev. F. D. Morice, the smallest known bee, *Ceratina parvula*, and the largest bee, *Xylocopa* sp.? Gilbert White's "Hoop-shaver bee" *Anthidium manicatum*, the famous "Upholsterer bee" *Osmia papaveris*, and a Mediterranean snail-shell inhabiting bee, *O. ferruginea*, together with

microphotographs of the "saws" of the sawfly genus *Dolerus*.—The Rev. J. E. Tarbat, *Gnophos obscurata* from many localities, including ochreous and almost black forms from the same place, Budleigh Salterton.—Mr. Barnett, a fine varied series of *Apamea leucostigma* and var. *fibrosa* from the Fen District.—Mr. Schooling, a second brood *Arctia caja* with only an imperfect narrow fascia and a few apical and costal spots of cream colour on the fore wings.—Mr. Colthrup, a very long series of this year's *Colias hyale* from E. Kent.—Mr. H. B. Smith, a *Melanippe montanata* almost white, *Catocala nupta* with smoky-brown hind wings, three *Agrius convolvuli* from Warlingham, with specimens of *Phryxus livornica*, *Sterrhia sacraria*, *Laphygma exigua*, *Plusia ni*, and series of *Polia xanthomista*, and *Eunidia phleas*, including a partial var. *schmidtii*, all from S. Cornwall, in September last.—Mr. Sich, the Gelechiid *Argyritis pictella*, which used to occur on Barnes Common and, for Mr. Green, *Depressaria putridella* from its N. Kent habitat.—Mr. W. G. Blair, teratological specimens, *Mimas tilæ* asymmetrical, *Carabus catenulatus*, with reflex margins of thorax excised, and *Imelia fornicata*, right antenna doubly branched, and, for Mr. W. N. Blair, examples of the Medicinal Leech from the New Forest.—Mr. Tonge, stereoscopic slides of lepidopterous ova *in situ* wild laid, with specimens of the imagines, genera *Trochilium* and *Ageria*, and also varied bred series of *Cularia truncata* (*russata*) and *Lobophora viretata*.—Mr. Pratt, an extreme dark margined form of *Ephyra pendularia*.—Mr. Baumann, *Hydriomena furcata* (*sordidata*), bred, from Surrey, with a black series from Manchester, very pale *Dianthæcia carpophaga* from the Sussex coast, &c.—Mr. Scorer, aberrations of *R. phleas* long-tailed, spotless under side, *P. machaon* heavily banded, *Euchloë cardamines* with white streak through the orange patch, *Porthea similis* with black edged costa, *Callimorpha dominula* with rounded wings, *P. napi* male, heavily spotted, &c.—Mr. St. Aubyn, two ab. *flava* of *A. filipendule* from Coulsdon.—The Rev. F. M. B. Carr, a collection made in Mid-Wales last June, including *Plusia interrogationis*, a fine varied series, *Acidalia fumata*, *Agrotis lucerneæ*, &c.—Mr. Andrews, dwarf Diptera, *Bombylius major*, *Eristalis pertinax*, and *Chrysochlamys cuprea*, and, for Mr. Barraud, a teratological specimen of *Spilogaster uliginosa* with missing fourth longitudinal vein.—Mr. Stanley Edwards Papilionidæ, *P. polices* and allied *P. hurlinus* and *P. nyassinus* from Africa compared with *P. ajax* and *P. marcellus*, American.—Mr. Platt Barrett, male and female comparisons of British and Sicilian butterflies, *G. rhamni* and *G. cleopatra*, *Hipparchia semele* and var. *alyrica*, *E. jurtina* var. *hispulla* and var. *fortunata*, a long series of *Euchloë damone*, sets of geographical forms of *Melanargia galathea*, British, Alpine, Apennine, Calabrian, Sicilian, at various elevations, &c.—Mr. Barnett, for Mr. Canot, a *Wheeleria spilodactyla*, Freshwater, with no cleft in fore wings and one only in hind wings.—Mr. Kaye, an unusually large spray of the magnificent orchid *Cattleya labiata*, five flowers.—Mr. Pickett, results of breeding *Angerona prunaria* under coloured muslins, red, pink, orange-yellow and cream with green pattern, and aberrational series of *M. galathea*, *Agriades corydon* (*semi-syngrapha*, *obsoleta*, *striata*, *minor*), &c.—Mr. Sheldon, European Diurni taken by himself in the Riviera, S. Spain, Digne,

&c., including fine series of *Zegris eupheme* var. *meridionalis*, *Thais rumina* var. *canteneri* var. *medicicasti*, and ab. *honoratii*, *Araschnia levana* var. *prorsa* and var. *porima*, &c.—Mr. Frisby, nearly all the species of British bees in the genera *Andrena* and *Cilissa*.—Mr. W. J. Kaye, a drawer of species of Syntomidæ he had taken at flowers in S. Brazil, and gave notes on their habits.—HY. J. TURNER, *Hon. Report. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, November 20th, 1911.—Dr. John Cotton in the chair.—Dr. P. F. Tinne read a paper on "The Application of the Lumière Process of Colour Photography to Entomology," and in the course of a most interesting address exhibited a number of colour portraits of Lepidoptera in their native haunts, as well as pictures of places he had visited when in the pursuit of insects. It is quite evident that there is a great future for this class of work as soon as coloured prints can be taken direct from the negatives.—Mr. Robert Tait, Jr., exhibited a fine lot of insects from Braemar, the results of his summer holiday which was spent in that locality. These included a very fine series of *Plusia interrogationis*, *Dasychia obfuscaria*, *Cænonympha typhon*, *Zygana erulans*, *Nemeophila plantaginis*, and var. *hospita*, the last being obtained as a partial second brood in October. Varied but smaller series of the following were also shown:—*Cidaria populata*, *C. immanata*, *Coremia munitata*, *Larentia cæsuata*, and *Halio brunneata*; Mr. Tait further contributed an interesting account of his holiday with remarks upon the variation, &c., of the insects captured.—Mr. Wm. Mansbridge exhibited a series of *Polia chi*, taken in the Huddersfield district on August Bank Holiday, comprising the melanic forms for which that neighbourhood is famous.—OSCAR WHITTAKER AND WM. MANSBRIDGE, *Hon. Secs.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—The first meeting of the 1911-12 Session was held in the Manchester Museum, Owens College, on Wednesday, October 4th, Mr. B. H. Crabtree in the chair. The following exhibits were made:—Mr. R. Tait, Jr., a long series of varieties of *Abraxas grossulariata*, all bred from some two or three hundred larvæ from the Huddersfield district; beautiful series of *Boarmia repandata*—a black form from North Wales, var. *conversaria* and the type from South Wales; series of *Diacrisia sanio* (*russula*), *Drepana falcataria*, *Perconia strigillaria*, *Geometra papilionaria*, *Cybosia mesomella*, from Wyre Forest, June, 1911; *Aplecta advena* from Monkswood, *A. tincla* from Wyre Forest, *Boarmia roboraria* from Monkswood, &c.—Mr. B. H. Crabtree, bred series of *Boarmia repandata* from Delamere and Cornwall, *Ennomos autumnaria* from Southend stock, *Agrotis ashworthii* from North Wales, *Mamestra dissimilis* from Manchester; also a series of *Cænonympha typhon* from North Lancashire, *Erebia epiphron* and *Parascemia plantaginis* (with var. *hospita*) from the mountains near Helvellyn.—Mr. W. P. Stocks, a large number of species taken at Silverdale and Witherslack during June. These included, from Witherslack, series of *Cænonympha typhon*, *Diacrisia sanio*, *Acronycta menyanthidis*, *Acidalia fumata*, *Perconia strigillaria*, &c. From Silverdale were

Chærocampa elpenor, *Nudaria mundana*, *Thyatira batis*, *Xylophasia sublustris*, *Mamestra furva*, *Aplecta nebulosa* (pale form), *Mamestra dissimilis*, *M. contigua*, *Boarmia repandata* (dark, light, and intermediate forms), *Cucullia umbratica*, &c.—Mr. C. F. Johnson, series of *Asteroscopus nubeculosa* from three-year-old pupæ; *Dianthæcia capsophila* bred from a bag of campion-pods from Howth; *Lophopteryx camelina* from ova laid on June 10th—these emerged in mid-August and had taken only ten weeks from ovum to imago.—Mr. G. Storey, the following from the breck-sand district of Suffolk:—*Danthæcia irregularis*, *Emmelesia trabealis* (*sulphuralis*), *Acidalia rubiginata*, *Lithostege griseata*. From Wicken Fen: *Leucania straminea*, *L. impudens*, *Cænobia rufa*, *Arsilonche albovenosa*, *Bombycia viminalis*, *Bankia argentula*, &c., and a dark variety of *Strenia clathrata*. From Cambridge: *Agrotis puta*, *Mesotype virgata*, and *Bryophila glandifera* var. *impar*. From the New Forest: *Boarmia roboraria*, *Eurymene dolobraria*, *Diacrisia samio*, and *Hemaris fuciformis*. He also showed a female variety of *Argynnis selene* from Brockenhurst; a blue female variety of *Lycæna corydon* from Cambridge; a yellow male variety of *Cosmotriche potatoria* from Wicken Fen; a male variety of *Saturnia pavonia* from Delamere; and a fine *Melanippe fluctuata* var. *costovata* from Brooklands, Cheshire.—Mr. H. Massey, a drawer of *Xanthia aurago* from Reading and Worcester.—Mr. Wm. Mansbridge, a fine series of *Silenia bilunaria* types and var. *brunnearia* from Delamere, and a series of *Aplecta nebulosa* bred from *robsoni* parents from Delamere; these showed intermediate forms.—Mr. J. H. Watson, living larvæ, feeding on rose, of *Hylesia muscula*, a well-armed Saturnid larva from Brazil, and also a pair of imagines. Newly described forms of the Saturnidæ, viz.:—*Philosamia lunula* sub. sp. *fusca*, and *Actias selene* sub. sp. *callandra*, both from the Andaman Islands. *Caligula japonica* and *C. simla* and a hybrid between them, to which the name of *Caligula* hybrid *salmonii* has been given, after Mr. Albert Salmon, who obtained the cross. A remarkable gynandromorphous specimen of *Antheraea mylitta*, hatched from a cocoon from Bengal. In this portions of the body and sections of the wings are golden yellow like a var. *silvalica*, the rest of the insect being of the chestnut-red male colour. Portions of each antenna have both male and female pectinations; the genitalia are chiefly male, but not typical.—Mr. J. C. Cope, examples of Canadian Coleoptera of the following genera:—From Toronto: *Pterostichus*, *Harpalus*, *Amara*, *Hydróüs*, *Cybister*, *Coccinella*. From Winnipeg: *Anchomenus*, *Bembidium*, *Hister*.—Mr. A. W. Boyd, series of *Cænonympha typhon* from Delamere, *Erebia epiphron* from Great Gable, *Boarmia repandata* and *Agrotis ashworthii* from North Wales, *Carsia paludata* from South Lancashire.

November 1st.—Mr. W. Buckley, the President, in the chair.—Mr. R. Tait, Jr., gave a paper on "An Entomological Trip to Braemar," illustrating his remarks with series of the insects captured. These included very long series of *Gnophos obfuscata* and *Plusia interrogationis* and fine series of *Cænonympha typhon*, *Zygæna exulans*, *Coremia munitata* (including a partial second brood), *Thamnomoma brunneata*, *Lygris populata* (very varied), and *Parasemia plantaginis* types and var. *hospita*, bred as a second brood.—Mr. W.

Buckley showed a very long and varied series of *Acidalia contiguaria* from North Wales ova, comprising three broods.—Mr. A. E. Salmon remarked that there had been great difficulties in breeding Saturniidae this year, *e. g.*, a brood of larvæ was divided up and each lot put into a separate room and fed on food from different trees; all died on the same night. He also stated that there had been a second brood of *Nonagria typhæ* this year.

December 6th.—Mr. W. Buckley, President, in the chair.—Mr. A. E. Wright gave a paper on the "Macro-Lepidoptera of the Burnley District" (with the exception of the Noctuæ). His list was the outcome of many years of collecting, and possibly its most remarkable feature was the absence of many common insects. The most noticeable feature of the insects as a whole was the general tendency to melanism. Fine black forms of *Ematurga atomaria* (both male and female), *Gonodontis bidentata*, *Entephria cæsiata*, &c., were shown.—Mr. J. H. Watson showed an example of *Saturnia pyretorum* sub. sp. *pearsoni*, a new subspecies from Hainan.—Mr. B. H. Crabtree exhibited empty pupæ and living larvæ of *Luperina gueneei* from the Lancashire coast.—Mr. G. Bradburn showed, among others, a variety of *Saturnia pavonia* from Lindow Common, Cheshire, and a red form of *Smerinthus populi* from Brooklands, Cheshire. He also had two specimens of *Porthesia similis* taken at Brooklands on October 18th and 20th.—Mr. C. F. Johnson showed a series of *Acidalia contiguaria* (third and fourth broods); a long series of *Oporabia filigrammaria* and series of *Acidalia imitatoria* and *Hygrochroa springaria* (second brood).—Mr. R. Tait, Jr., showed a bred series of *Agrotis agathina* from North Wales.—A. W. Boyd, M.A., Hon. Sec.

RECENT LITERATURE.

1. *Annals of Tropical Medicine and Parasitology*. In vol. v. No. 1, April 20th, 1911, Liverpool, the papers of interest to Entomologists are:—(1) Non-ulcerating Oriental Sore: the cultural characteristics of the parasite as compared with a new similar parasite in *Erthesina fullo* (Thunb.), a pentatomid bug, by Capt. R. Markham Carter, I.M.S.; (2) A very short note on *Glossina grossa*, &c., by R. Newstead, M.Sc., A.L.S., &c.

In vol. v. No. 2, August 1st, 1911, there are also two papers:—(1) The Papataci Flies (*Phlebotomus*) of the Maltese Islands, by R. Newstead, pp. 139–181, a full and well illustrated paper; (2) Some new species of African Mosquitos (*Culicidae*), by R. Newstead and H. F. Carter.

2. *Memorias do Instituto Oswaldo Cruz*. Rio de Janeiro. The following papers may be of interest to Entomologists. (1) *Erephopsis auricincta*, a Tabanid of the subfamily Pangoninae (April, 1909); (2) Beitrag zur Kenntniss der Dipteren (April, 1909); Beitrag zur Kenntniss der brasilianischen Simuliumarten (August, 1909); (4) Ueber eine neue Trypanosomiasis des Menschen, in connection with a bug, *Conorhinus megistus* (August, 1909); Cytologische studien ueber "*Adelea hartmanni*," ein neues Coccidinmaus dem Darne von *Dysdercus ruficollis* L.

- (1910); (5) Further account of *Conorhinus megistus* (1910); (6) Zweiter Beitrag zur Kenntniss der brasilianischen Simuliumarten (1910); (7) Neue Beitræge zur Kenntniss der Pangoninen und Chrysopinen Brasiliens (1911).
3. *House-Flies, and their Connection with Disease*. Farmers' Bulletin, 459; U. S. Department of Agriculture. Washington. 1911.
 4. *A Manual of Philippine Silk Culture*. By Chas. S. Banks. Bureau of Science, Manila. 1911. Pp. 1-53, with 18 fine plates.
 5. *Leitz' Catalogue of Prismatic Binoculars*, 9, Oxford Street, London, W. Entomologists may perhaps be interested in examining a catalogue of these fine instruments.

W. J. L.

OBITUARY.

IT is with deep regret that we have to announce the death of MR. ARTHUR COTTAM, who passed away on November 23rd, 1911, at his residence, Furzebank, Bridgwater, in his seventy-fifth year, after an illness of some months' duration.

As an entomologist he was perhaps better known to the past generation, as recently, owing to the weight of increasing years and failing health, he was not able to take such an active interest in the Lepidoptera and Coleoptera as formerly. His collection of Lepidoptera, the second which he had amassed during his lifetime, was sold at Messrs. Stevens's Auction Rooms only ten days before his death.

From his young days he had been an ardent student not only of entomology but of botany, astronomy, and microscopy; and in January, 1875, he, with a few others, founded the Hertfordshire Natural History Society (at first called the Watford Natural History Society), and was its first Treasurer. He did some active work, and contributed several papers to the Transactions.

For many years he was a Fellow of the Royal Astronomical Society, and published some useful star-maps.

Music and art also claimed a good deal of his spare time, outdoor sketching being one of his favourite occupations at all times of the year.

In 1905 Mr. Cottam retired from the Civil Service (Office of Woods and Forests) and went to live at Bridgwater.

His love and all-round knowledge of Nature from many points of view, which he was always ready and anxious to impart to others, made him a most interesting companion, and the writer can recall many delightful excursions made in his company.

He leaves a widow and one daughter to mourn his loss, his only son having died suddenly some nine months ago, after an operation.—
P. J. B.

MICHAEL C. DIXON died December 2nd, 1911, at Spennymoor, Durham, aged thirty-seven years. He was attached to the study of Lepidoptera, and specially interested in the preparation of the early stages to illustrate life-histories. His occupation was that of a post-man. He was a member of the Carlisle Natural History Society.—
G. B. R.

GAVARNIE, JULY, 1911.



West Newman proc

H R

B. C. S. WARREN.

FAYOL, cadet.

H. ROWLAND-BROWN.

P. RONDOU.

CHARLES OBERTHUR.

HENRI OBERTHUR.

THE ENTOMOLOGIST

VOL. XLV.]

FEBRUARY, 1912.

[No. 585

A NEW SPECIES OF PHASMIDÆ OF THE GENUS *PRISOPUS*, CONSIDERED ESPECIALLY IN REF- ERENCE TO THE SUPPOSED AQUATIC HABITS OF THE GENUS.

By C. J. GAHAN, M.A.

(Published by Permission of the Trustees of the British Museum.)

Prisopus is a genus of Phasmidæ which, owing to the singularity of its form and structure, cannot very well be described either as a "stick" insect or as a "leaf" insect; but it is one of exceptional interest, inasmuch as it was believed to live under water, and to be eminently adapted by its structure for that mode of life. The species of the genus inhabit tropical America, and those that are known are few in number and apparently rare, very few specimens having yet found their way into public or private collections.

I was glad, therefore, to be able to recognize as a member of this rare and interesting genus an insect which was recently brought to the British Museum and shown to me by Mr. F. G. Fisher, who discovered it at Xapury, a township on the River Acre, in the Amazon Valley. And I was still more pleased when Mr. Fisher very kindly offered to present it for the Museum collection, where we found we had no species quite like it. From investigations which I have since made, the species appears to be new; so I have ventured to name it *Prisopus fisheri* in honour of its discoverer. A more detailed description of this new species is given below. Here I wish more particularly to call attention to certain points about it which serve to throw a light upon the supposed aquatic habits of *Prisopus*; and to say something also in reference to another Phasmid genus, *Cotylosoma*, to which similar habits have been attributed.

When first I saw the specimen brought to me by Mr. Fisher, it struck me at once as being an extremely good and very beautiful example of protective resemblance. And then, though I felt there was no need for the question, I asked him where he found it. The answer was very much as I expected. Mr. Fisher

found the insect at rest in the daytime on the trunk of a tree ; a small tree or sapling, he could not remember which, nor did he know the name of the tree, but that did not much matter. What chiefly impressed me about the creature was the great resemblance it had to an ordinary piece of bark, and how remarkably well its colours seemed adapted in combination with every other feature to bring about that resemblance. Not that there was anything wonderful in all that ; resemblances of a similar kind, many of them quite as perfect, some even more so, are quite familiar to us ; and they are especially abundant amongst the Phasmidæ. But we know that the "stick" insects and "leaf" insects do not go and hide themselves under water all day ; and I had a vague recollection that that was what *Prisopus* was supposed to do. It was impossible to believe this of the insect before me ; for, in such case, its colours and all the remarkable adaptations of structure I noticed could have no use and no signification. So I determined to refresh my memory, and to find out what was known about the habits of the genus.

Turning, first of all, to the 'Cambridge Natural History' where, as I knew, there was a most interesting account given of the Phasmidæ and their habits, I came upon the following statement :—"In Brazil a species of the genus *Prisopus* has the peculiar habit of seeking shelter under the stones submerged in the mountain streams ; to enable it to do this it is remarkably constructed, the under side of the body being hollowed, and various parts set with a dense fringe of hairs ; the insect is supposed to repel the air from the body in order to adhere to the upper surface of a stone, where it sits with its fore legs extended in front of its head, which is directed against the current."

That was a sufficiently startling statement about a species of Phasmidæ, and I felt certain that Dr. Sharp would not have made it except upon very good authority. Who or what was this authority I had now to find out. So I looked up the genus *Prisopus* in the most recent work on the family, an excellent monograph by Brunner von Wattenwyl and J. Redtenbacher, and very soon found what I wanted. The authors say of *Prisopus* that :—"This remarkable genus lives, according to Murray, in water, where with their hollowed-out ventral side the insects hold on to stones, with the body directed up stream." The same story again, more briefly stated, for which Murray, it appeared, was the authority.

Andrew Murray was a well-known scientific man, and an entomologist of wide experience, who had written much about various groups of insects, including the Phasmidæ, to which he had given a very fair amount of attention. What he had to say on the subject, therefore, was bound to be of considerable interest. It is to be found in his paper "On the Habits of the *Prisopi*,"

which was published in the 'Annals and Magazine of Natural History,' in the year 1866 (Ser. 3, vol. xviii. pp. 265-268). That paper is certainly well worth reading in full. But its chief point of interest for the moment is that it brings us to the fount and origin of that remarkable little story about *Prisopus* which has been repeated, as we have seen, by other writers.

The real author of the story, however, remains so far anonymous that he is only known to us as a "person," later on dignified by the title of "observer," in whose veracity Mr. Alexander Fry, to whom he first related the story, had the fullest confidence.

The story had reference only to one species of *Prisopus*—*P. flabelliformis*, but, as Murray very truly remarks:—"All the species are characterized by the same peculiarities of structure, and the habits of one will doubtless be the habits of all.

"According to this observer, then, the insect was obtained by him in the mountains of Brazil; and its habits were to spend the whole of the day under water, in a stream or rivulet, fixed firmly to a stone in the rapid part of the stream, but on the approach of dusk to sally forth into the night air."

Murray believed this story; he was not so much struck by its great improbability, as by the lack of perception on the part of other distinguished entomologists, who had not discovered in the structure of the genus the most admirable and most perfect adaptation for the very purpose explained by the "person." And the rest of his paper is almost wholly taken up with a very detailed description of the insect, in which he proceeds to show how every single detail of its structure fitted in with the story told about its aquatic habits.

The details which he has given of the structure are, with one exception, and apart from the interpretation he placed upon them, very accurate, and may be quoted here *in extenso*, since they apply almost equally as well to the species discovered by Mr. Fisher. The one exception refers to his account of the tegmina or wing-covers. These structures do not reach to the end of the body, nor do they completely cover over the under wings, in any known species of the genus. So that if his description is correct, the species described could not have been *flabelliformis*. But it looks to me as if Murray, in his haste to see "waterproof" structures everywhere, mistook for a continuation of the wing-covers that considerable part of the under wings which projects beyond them, and which is usually coloured so exactly like them in resemblance to bark. It is to be noticed, too, in his description which follows that not a word is said about the coloration of the insect:—

"The whole underside, even the head, is hollowed out like the half of a reed. The surface of that side is flexible, smooth, and highly polished. The margins are thinned off, and the

segments of the abdomen, where not fitted to the posterior legs, are provided with flaps or quasi claspers. All the legs fit most beautifully and closely to the side of the abdomen [body rather]. Their outer margin is dentate and provided with a thick fringe of hair, which, like the feathers of a duck, repels water. Moreover, at the knee-joint [this applies only to the front legs] where there is unavoidably an opening or unprotected space, it is provided with a flap, or side knee-pan—a provision which occurs in no other insect with which I am acquainted. This flap hangs down, filling up the opening, and is furnished, like the rest of the outer margins of the leg and body, with a supply of hair impervious to water. The posture of the animal in the water is: fastened to the upper surface of a stone, and with its head turned up stream in opposition to the current. It sits with its forelegs extended forwards in front of the head, and the inner side of the thighs is hollowed out exactly to fit the sides of the head, and the thigh itself is bent down so as to form a continuation of the sides of the long cup or saucer which the underside of the animal represents. The antennæ fold back on the upper-side of the head, where there is a depression to receive them. In the other Phasmidæ the tegmina or upper wing-cases are usually short, narrow and coriaceous, and apparently not fitted for much use. Here they are as long as the body, so as to cover the whole of the large underwings when folded up; they are broad enough to do so; and the whole are only of a semi-coriaceous texture, flexible and pergaminous, but most so at the base, thinning away at the termination into a finer texture, approaching that of the lower wings. The claws of the tarsi are strong, powerful, and well adapted for clinging."

Not satisfied with the proofs thus set forth of its aquatic habits, Murray next goes on to endow the insect with powers possessed by no other insect known:—

"In this animal we seem to have a combination of two plans of structure: there are the claws and claspers and flaps for holding on by; there is the hollow underside for adhering, by exhausting the air between it and the stone it clings to, on the principle of the air pump. If, when it settles on the stone and adjusts itself, its tracheæ are full of air, and it then expels the air and by muscular power draws in the skin of the abdomen and underside generally, it must, of course, leave a vacuum, and consequently adhere like a sucker."

We need not dwell upon the extravagance of the suggestions put forward here by Andrew Murray. It is enough for us to know that there is an insect, in all essential respects exactly like the one described by him, which has the habit, not of clinging to stones under water, but of spending the day in clinging by means of its strong claws alone to the bark of a tree. We can see how well this insect is adapted by its colours for concealment

in such a situation, and we can see also that the so-called claspers on the abdomen, the knee-pans, the fringes of hair, the dentate margins of the legs, &c., are only so many further adaptations, all of which lend themselves obviously to the same purpose of concealment. The under side of the insect's body is smooth and polished, and of a reddish-brown colour marked a little with black; but that is just the part which, when the insect is at rest, cannot be seen. That it should act like a sucker, seems a physical impossibility; and one needs only to examine the insect awhile to see how absurd is all the talk about the imperviousness to water of its various structures.

As evidence, therefore, of the aquatic habits of *Prisopus*, all the wealth of "corroborative detail" supplied by Murray must be regarded as absolutely valueless, although, no doubt, it did succeed in giving "artistic verisimilitude to a bald and unconvincing narrative," and must have exercised a strong influence on the judgment of subsequent writers, who, without it, we may be well persuaded, would not for a moment have given credit to a story so highly improbable, so utterly opposed to everything known about the habits of the Phasmidæ.

Wood-Mason, well known as an authority on the morphology of insects, was one of those who fully accepted Murray's account of the habits of *Prisopus*; and when his attention was called to another Phasmid, apparently closely related to that genus and distinguished by having a row of five flat oval, fringed structures attached to each side of the metathorax, he at once jumped to the conclusion that these structures were tracheal gills, and he has described them as such, giving to the insect the name of *Cotylosoma dipneusticum*. "This insect," he writes, "is closely related to the *Prisopi*, but is even more profoundly modified for an aquatic life; for it breathes, not only in the ordinary fashion amongst insects by means of tracheæ opening by stigmata to the exterior of the body, but also by the structures known as tracheal gills." His statement seems to have passed unchallenged until, in 1895, both Dr. Sharp and Mr. C. O. Waterhouse called attention to it, and expressed their doubts about the function attributed to the so-called tracheal gills. The question, however, as to the true nature of the structures was left undecided. Having examined them lately, I have come to the conclusion that they cannot possibly be tracheal gills. In the first place, they exhibit no traces whatever of tracheæ, and, secondly, they are dotted all over with dark pigment spots. They are to a certain extent movable, and they are in form and structure, as Waterhouse has pointed out, very like the two flat oval appendages at the base of the front tibiæ in *Prisopus*, the so-called "knee-pans" described by Murray. And it appears to me that their purpose is the same—to effect the better concealment of a part which, without them, would be somewhat too

easily seen. For this purpose it is an advantage that they should be movable, since they could be adjusted to slope down from the sides of the body to the surface on which the insect rests, playing the same part for the metathorax as the hind legs do for the abdomen, and the middle legs for the fore part of the body. It will be noticed that in the new species of *Prisopus* there is a well-marked triangular process on each side of the metathorax, corresponding in position with the movable appendages of *Cotylosoma*; and as to the meaning of this process there can be very little doubt.

Apart from the assumption made by Wood-Mason, there is no reason whatever for believing that *Cotylosoma* is aquatic in its habits. On the contrary, we have very good reason for believing that it is not. Before Wood-Mason wrote his paper, some years even before Murray's paper appeared, MacGillivray described as *Prisopus carlotta* a species which really belongs to the genus *Cotylosoma* and which is very closely indeed allied to *dipneusticum*. Concerning this species he tells us:—"The colour is variable; it is either a dull greyish-green, finely and irregularly mottled, or silvery-grey, also mottled, having greenish and yellowish shades, altogether reminding me of some of the lichens." Very unusual colours for an aquatic insect, but by no means exceptional in an insect which "is said," as MacGillivray further states, "to be found on the trunks of trees."

Prisopus fisheri, n. sp.

Colour: on the exposed parts of the head, thorax, femora, and tibiae light yellowish brown, with a more or less considerable admixture of ashy white and greenish white; on the elytra, dark green at the base and over the basal prominences, dark brown beneath these on each side, yellowish brown, varied with greenish grey over the rest of the surface, but becoming darker towards the apex, and with two dark brown spots on each elytron a little past the middle; pale grey on the upper surface of the anterior segments of the abdomen, dark brown on the posterior segments; exposed parts of the under wings coloured like the posterior half of the elytra, the folded parts pale green, mottled irregularly with dark brown; body beneath chocolate-brown on the abdomen, pale testaceous on thorax, with blackish hind border to the meso- and meta-sternum.

Head without spines, but with four short rows of small tubercles above extending forwards from the occiput, and with a crenulate carina, beneath which is a dark line, along each side. Pronotum without spines, and bearing only a few very inconspicuous granules. Mesonotum relatively rather short. Metathorax with a conspicuous triangular process on each side, whose edges are somewhat dentate, and with a few lateral cariniform tubercles placed anteriorly. Elytra furnished each with a large, laterally prominent, hump or tubercle near the base.

Length : of body, from front of head to apex of abdomen, 67 mm. ; of pronotum, $4\frac{1}{2}$ mm. ; of mesonotum, $5\frac{1}{2}$ mm. ; of elytra, 36 mm.

Breadth : of metathorax, measured below the elytral prominences, 13 mm.

Hab. Xapury, on the River Acre, Amazon Valley.

This species appears, on the whole, to be most nearly allied to *P. horstokkii*, de Haan, but is readily to be distinguished from



Photo H. Main.



H. Knight del.

that species and from all others of the genus by the strong triangular process on each side of the metathorax.

One of the figures is from a drawing made by Mr. Horace Knight to show the insect in what we conceive to be its resting position, with the legs placed, slanting outwards, alongside the body; the other, from a photograph for which I am indebted to Mr. Hugh Main, represents the insect just as it was received—the middle legs hidden through being tucked in under the body, and the flexible lobes at the sides of the mesothorax and abdomen bent in more than would be quite natural in the living insect.

THREE WEEKS IN THE HIGH PYRENEES.

By H. ROWLAND-BROWN, M.A., F.E.S.

(PLATE II.)

THE summer of 1911, entomologically speaking, appears to have been remarkable in the Central Alps by reason of the comparative scarcity of butterfly life. In the Pyrenees things were by no means so bad as reported by our Swiss collectors, though I cannot say that Lepidoptera were anything like as abundant, with one or two notable exceptions, as I found them in the same localities in 1905. The climate of the Hautes-Pyrénées is notoriously uncertain in the higher ranges; settled weather is scarcely ever experienced for any length of time, and last July, though the sun blazed from a cloudless sky throughout the month on the plains, we had none too much of his majesty at Gavarnie. The tiresome cross-journey from Eaux Bonnes *via* Pau, up to the last hour or two when we were well on the road from St. Sauveur to Gèdre, was insupportably hot. But by the time we had come to the upper valley of the Gave de Gavarnie the clouds had gathered round the higher mountain peaks, and it was raining as we pulled up at last before the Hôtel des Voyageurs, to receive a most kindly welcome from M. and Madame Vergez-Bellou. Here we remained from the 13th to the 30th, Mr. A. H. Jones, Mr. G. T. Bethune Baker, and, lastly, Mr. C. J. Wainwright swelling the entomologist population, already represented by M. Charles Oberthur and an energetic party of young hunters; while from Gèdre presently came M. Rondou, full of kind information and suggestions for our explorations. I had, however, already some knowledge of the country, and our first day was devoted to an *Erebia* hunt in the high valley under the Pic d'Astazou to the left of the famous Cirque. The clouds of yesterday had now dissolved, and it was under a radiant blue sky and in bright sunshine that we mounted the steep zigzag which leads up to the iris-covered slopes which six years before had provided the finest collecting-ground for me in the Pyrenees. Nothing apparently was changed. The mule-path was as rough and broken as ever; the humming waters of the cascades on either side made music in our ears, and the great purple iris swept in waves of delicate colour down the mountain side as far as the eye could see. But a change there was, and very much to our disadvantage; for, whereas these preliminary slopes swarmed with butterflies in 1905, with the exception of one or two species nothing was now really abundant; while on the ground where I took so many lovely *Anthrocerids*, not a single one did I see either on this or on any one of the several subsequent excursions in this direction. Indeed, the *Burnets* were practically non-existent at

Gavarnie this year, the only one even approaching abundance being *A. exulans*, on the opposite side of the Cirque at about 7000 ft. With these and a lonely example of *A. contaminæ* my three weeks' list is practically complete!

Arriving at the top of the zigzag the ground opens out somewhat with steep side slopes, terminating at the lower path level with beech woods and occasional firs. The numerous flocks and herds hereabouts had grazed the pasture thin, but still there were plenty of wild flowers and stubby conifers to attract the butterflies, it being noticeable, in this connection, that *Plebeius argus*, which was flying in hundreds, preferred the shrubs to the plants when at rest. A few days later, on the same ground, the females of this dainty "Blue" had almost entirely superseded the males, and were equally abundant. Of the latter I took one or two, and examined a great many for aberrations, but beyond occasional examples with the orange marginal lunules of the upper side obsolete, I found little worthy of remark. Mr. Lowe (Brit. Butterflies, Tutt, vol. iii. p. 182) notes this form in Guernsey apparently—"entirely fuscous"—but I am not familiar with it elsewhere, and it is curious that Tutt, who was singularly fertile of names, did not (I think) consider it worthy of a special designation. While I am on this subject, I may also mention that the Gavarnie form of *Agriades corydon* is quite characteristic, and M. Oberthür in the first instance drew my attention to an almost constant variation of the *under side* of the male. On the fore wings, which are silvery white, no markings of any sort remain except the discoidal spot and the antemarginal sickle-shaped row, which is composed of abnormally small and sharply defined spots. The hind wings are of the same colour as the fore wings; the marginal spots survive, but the marginal thin line and the orange lunules are almost imperceptible. The bases are powdered silvery blue; the basal, costal, and antemarginal spots *all* without ocellation, and very small. Indeed, were it not for the remaining black spots on the marginal row of the hind wings, the whole facies bears a strong resemblance to the under side of *Polyommatus meleager*, male. *Corydon* was just coming out when we arrived; it was afterwards plentiful locally. The females showed no tendency to blue suffusion, as was also the case with those of *P. argus*, but I took one of the pretty form on which all four "discoidals" are strongly edged with white (= *ab. albicincta*, Tutt). A rather striking peculiarity of the "Blues" this year in the Central Pyrenees was what might be called their emergence by instalments, and it happened both with *corydon*, and more markedly with *P. pyrenaica*, that just when the males appeared to be on the wane there would come (often in the same localities) a fresh supply to take the places of the forwards.

To resume my account of the 14th of July—the lower slopes yielded little beyond some bright fine *E. tyndarus* of the eyed-form, for which it appears we must now revert to the Von Hochenwarth's prior name (1785) of *cassioides* (= *dromus*, H.-S.): the females were few and far between; nor was there any profusion of *E. epiphron* var. *pyrenaica*, H.-S.—that is to say, the *cassiope* form with broad, bright, macular chestnut bands and large spots—though I quite agree with Mr. H. J. Elwes (Trans. Ent. Soc. 1898, p. 174) that these characteristics are themselves inconstant, and that the form hardly deserves a varietal name, even in these days when it is the fashion to overload our catalogues with undistinguished Latinity. Keeping to the left, and ascending what appear to be interminable grass slopes, too closely cropped to sustain much lepidopterous life, at a break in the monotonous verdure there is an outcrop of stone. Hereabouts the hitherto ubiquitous *E. stygite* (Ruhl's var. *pyrenaica*, and about as "inconstans" as the last-mentioned "variety") left us, and our old friend *E. lappona* began to appear—all var. *sthenno*—and just before attaining the cow-shelter, which is beneath a vast overhanging ledge of rock, I netted an *Erebia* never before taken by me at Gavarnie—*E. manto* var. *cæcilia*, Hb.—actually an "all black" butterfly; and, oddly enough, though I afterwards found it in another locality in the Val d'Ossue away to the west, I captured no second example at this spot, and conclude, therefore (it was in perfect condition), that it must have been a stray. Higher again, where *E. gorgone* swarmed in 1905, and *E. lefebvrei* also, single specimens alone fell to my net. The latter butterfly, at all events, was not out. Round the "bergerie" rocks also flitted a considerable number of *Parnassius mnemosyne* (also new to me at Gavarnie), and though no undamaged examples were taken on this expedition, quite ten days later I picked up a decent male or two among the predominating ragged rascals.

Here also, flying at dizzy speed, were the males of *Hepialus alticola*, Obth., mentioned by me in my paper on Eaux-Bonnes, and Mr. Warren, when we came back on the 20th, discovered a specimen of the extraordinary apterous female, to which the males were assembling, and this I had the pleasure of handing over to M. Charles Oberthür, whose collectors were on the look-out for *alticola*, but apparently had not struck our excellent locality.

During the whole day we saw few other, even of the commonest, Alpine butterflies, and it was not until the 25th that *E. gorgone* (males) became really plentiful. The 15th was devoted to the Val de Poueyespée, the lateral valley leading to the Porte de Gavarnie, on the Spanish frontier, to the right of the Cirque looking south. This was another of my former pet hunting-grounds, and at almost the identical spot where I had

netted my first *P. pyrenaica* six years before I met with this exquisite little butterfly again. At a certain spring above the long series of zigzags, and on flower-covered rocks, the males were much in evidence for a few days—the black females very rare; I only took three in as many weeks. This spring also furnished several male *P. eros*, yet another welcome addition to my Gavarnie experiences, and on the marshy pasture in which the stream loses itself Mr. Warren netted one or two male *Colias phicomone*—this season again unaccountably rare. The damp ooze was a veritable Lycænid and Hesperiid trap; clouds of *P. argus* mingling with *P. hylas*, a few worn *A. thetis*, and a grand form of *Hesperia alveus*. Occasional *H. serratulae* also haunted the upper pastures, and the most beautiful race of *Pyrgus sao* I ever saw; the hind wings vivid carmine beneath, with the big costal white spots of pearly brilliance, but though we were both keeping a sharp look-out for *H. andromedæ*, we saw nothing of this new-found Pyrenean Skipper.

Ascending gradually, the "road" to Spain traverses a short series of skrees, and up and down the treacherous stone shoots, as long as the sun shines upon them, ascend and descend an endless procession of male *E. lefebvrei*, never in clusters, but singly. The best—in fact, the only—way to make sure of a series is to station oneself on the mule-track, and strike at the butterflies as they cross. But, in my experience, the females never came down or up to the path, and the two or three brought home by me must have been secured in one or other of the desperate rushes I made after some particularly fine male, who probably left me seated and sliding with half the mountain behind me after a last ineffectual sweep of my net! The higher slopes up to and underneath the snow produced nothing this year except worn *E. lappona*, and some fresh *Anthrocera exulans*; the aforesaid skrees my single *A. contaminei*. And here I may offer a correction, based on the unrivalled authority of M. Oberthür and my own far more limited range of observation in the Pyrenees, that, notwithstanding the records of Struve, d'Aubuisson, and Von Caradja, *E. glacialis* does not occur in the Pyrenees at all; strange though it may seem, the last two authors, at all events, having mistaken *E. manto* var. *cæcilia* for the ab. *alecto* of the highest flying of the western *Erebias*. The more closely we consider the mountain-butterfly items of Von Caradja's list for the Department of the Haute-Garonne, the more certain it seems that the author took many of his observations at second-hand. But M. Rondou is engaged on a new edition of his own 'Catalogue Raisonné des Lépid. des Pyrénées,' and in this no doubt such errors will be rectified. Lower down the "Coppers" were this year decidedly rare. Of *Chrysophanus hippothoë* (a beautiful sight upon the purple iris) I took one or two females and a male, practically identical with those I bagged in 1906 in

South Sweden. Of *Loweia alciphron* var. *gordius*, occasional males only came my way.

The Val d'Ossue, which we explored on the morning of the 16th, in the immediate neighbourhood of the village, proved the most repaying of all our hunting-grounds, and on the 19th, when we pushed further up on the Route de Vignemalle, we came upon the headquarters of var. *cæcilia* in a very "Garden of Eden" of iris, flying with *E. euryale*, and, with the exception of that mysterious single *cæcilia* on the 16th, this was the only locality visited where we found these two "Ringlets," neither of which I had encountered in 1905. *Euryale* is so common a butterfly in the Alps that one is apt to neglect it. But the range of variation in this single valley within a quarter of a square mile was simply astonishing. I hardly seemed to take two alike, from males with the rusty bands of the fore wings broad and lavishly spotted (but without white ocellations) to examples in which all trace of the spots have disappeared, leaving only the macular bands (= ab. *euryaloides*, Tengstrom), and others, again, in which the bands are reduced to two fulvous spots centred with black on the fore wings, and two minute fulvous spots at the anal angle of the hind wings (? = ab. *ocellaris*, Stgr.) ; while I have a vivid recollection of having smashed on the setting-board a male which appeared to have lost all traces of fulvous on the upper side of both wings. I visited this place on several occasions ; on the 27th, after Mr. Warren's departure, picking up a few of the much-wanted female *E. gorgone* on the rough ground by the torrent, and some exquisite female *H. virgaureæ*, Mr. Warren having already secured a grandly marked example, which he refers to ab. *lineolata*, Tutt.

By the 23rd, however, *P. pyrenaica*, which was common on the runnel side by the mule-path in the lower Ossue valley, had almost disappeared, for the terrific rain which descended almost without intermission from the afternoon of the 17th to the night of the 18th had wiped out the species. Meanwhile, the "assemblies" in this direction were even better attended than in the Pouyespée valley, and the mule-droppings especially drew immense numbers of "Blues" and Skippers, of which *Carcharodus lavateræ* soon became common, with occasional, and always single, *C. althææ*, *Thymelicus actæon*, and, among the grass, *Urbicula comma*, of which latter M. Henri Oberthür took a couple of the interesting aberration described ('Lépid. Comparée,' fasc. iv. p. 361) as ab. *faunula*, Obthür., with the white spots on the under side of the hind wings confluent, and forming a single large white spot tinted slightly yellow in the centre. I spent a whole morning on this ground trying to emulate his success, but unsuccessfully. On the 19th, however, *Satyrus alcyone*—the sole Satyrid observed this year at Gavarnie—put in an appearance, and almost simultaneously a fine fresh emerg-

ence of *Pyrameis cardui* took place. The other Vanessids were scarcely emerged, every nettle-patch being crowded with larvæ of *Aglais urticae*, and on the wet 18th we found a roadside birch towards Gèdre on which numbers of the larvæ of *Euvanesa antiopa* were taking a shower-bath, and apparently enjoying themselves vastly. Mr. Warren returned next day, and filled with them a huge tin box commandeered from Madame's kitchen, and I believe the majority of the brood should now be qualifying for "white-bordered" British "Camberwell Beauties" this spring, after hybernation in the comfortable thatches of mid-Buckinghamshire. I do not remember having noted the species in the mountains elsewhere feeding on birch; as a rule it prefers various kinds of willow. From the 25th onward to the 30th, when I left for Bordeaux, the weather was extremely unsettled, and nearly all the butterflies met with were becoming worn, after what was, certainly, in most cases, a remarkably short period of flight. I may add also that the usually common Pierids were quite rare, while I took but a single *Pontia callidice* on the Astazou side of the Cirque, *Parnassius apollo* being only occasional where formerly it was present in large numbers. Earlier in the year a very fine form of *Anthocharis simplonia* haunts the mountains round Gèdre; M. Rondou, when I visited his fine local collection, most generously presented to me a series of males and females. Mr. Warren took a worn example or two at the beginning of our visit.

BUTTERFLIES OBSERVED AT GAVARNIE, JULY 14TH—JULY 30TH.

HEPERIIDÆ. — *Garcharodus lavatera*, *C. altheæ*; *Hesperia carthami*, *H. alveus*, *H. serratulæ*; *Pyrgus sao*; *Urbicola comma*; *Thymelicus actæon*.

LYCENIDÆ. — *Heodes virgaureæ*, and var. *miegii*; *Chrysophanus hippothoë*; *Loweia alciphron* var. *gordius*; *Rumicia phlæus*; *Lycæna arion*; *Cupido minimus*; *Nomiades semiargus*; *Agriades corydon*; *Polyommatus hylas*, *P. escheri* and var. *rondoui*,* *Obthr.*, *P. eros*, *P. pyrenaica*; *Aricia medon* (a large form); *Plebeius argus*; *Strymon spini*.

PAPILIONIDÆ. — *Parnassius apollo*, *P. mnemosyne*.

* As this form of *escheri* has been only recently distinguished by M. Oberthür (Bull. Ent. Soc. Fr. 1906, pp. 57, 58, and Lépid. Comparée, fasc. iv. pp. 216, 217), I think it may interest our collectors to transcribe a short description from the latter work:—

Male.—Smaller than the type. On the upper side the blue, looked at in full daylight, shows a light greenish reflection; under side uniform grey ground colour, with the black spots very small, and the triangular white mark along the marginal border of orange-yellow spots on the hind wing almost wholly wanting.

Female.—Characterized by blue dusting of the wing bases on the upper side; the fringes of all four wings entirely white, and not brown with white at the apex as invariable in the type.

PIERIDÆ.—*Pieris rapæ*; *Pontia callidice* (one female), *P. daphidice*; *Anthocharis simplonia*; *Leptidia sinapis*; *Colias phicomone* (males only), *C. hyale*.

NYMPHALIDÆ.—*Argynnis aglaia*; *Issoria lathonia*; *Brenthis euphrosyne*, *B. pales* (the Gavarnie form is brilliantly coloured, and more definitely marked with black than the typical *pales* of the Alps), *B. dia*; *Melitæa didyma* (scarce), *M. parthenie*, *M. dictynna* var. *vernetensis*, Obthr.; *Pyrameis cardui*; *Euvanessa antiopa* (larvæ); *Aglais urticæ*.

SATYRIDÆ.—*Pararge mæra* var. *adrasta* (very fine tawny females), [*P. hiera*—I think M. Henri Oberthür took some worn examples in the Cirque, where it is known to occur in May and June], *P. megæra*; *Satyrus alcyone* var. *pyrenæa*, Obthr.; *Epinephele jurtina*; *Cænonympha arcania*, *C. pamphilus*; *Erebia epiphron* var. *pyrenaica*, *E. manto* var. *cæcilia*, *E. stygne*, *E. gorgone*, *E. lefebrei*, *E. euryale*, *E. tyndarus* var. *cassioides*, *E. lappona* var. *sthenno*.

Fifty-nine species in all.

Harrow Weald: January, 1912.

NOTES ON *LEUCANIA FAVICOLOR*, BARRETT.

By RICHARD SOUTH.

IN the autumn of last year the Rev. A. P. Waller, of Waldringfield, Woodbridge, Suffolk, very kindly sent for examination a number of Leucanid moths, among which was a series of twenty-five specimens that he had reared from ova deposited by a female *favicolor* taken in a marsh in the Woodbridge district. The eggs were laid in early July, 1910, and the moths emerged from pupæ, April to June, 1911. The majority of these specimens were referable to *L. pallens*, about nine to *favicolor*, and the remainder were intermediate in form, but approached more closely to *pallens* than to *favicolor*.

From ova obtained from a "*pallens*-like female," taken June, 1907, in the marsh previously referred to, Mr. Waller, in June, 1908, reared twenty-three specimens of *favicolor* of the typical form, and seven examples of the yellow form of *favicolor*—ab. *lutea*, Tutt. I must admit that I could not distinguish the female parent from *pallens*.

To illustrate the range of variation of *L. pallens* in his district, Mr. Waller included a series of captured specimens. Among these were a few of the red form, including one good example of ab. *ectypa*, Hübn. Another specimen seemed to be much nearer to typical *favicolor* than to *pallens*: indeed, if that speci-

men alone had been sent for identification, I should have returned it as *favicolor*.

Meditating on the significance of the above facts, a doubt arises as to the exact status of *favicolor*. Is it a species, or a salt-marsh development of *L. pallens*? The evidence afforded by Mr. Waller's material certainly seems to indicate that *favicolor* cannot be a species, except perhaps in the Darwinian sense. In any case, the insect is of very great interest, because, so far as we know, it is a purely British production.

The earliest recorded specimens of *favicolor* (one male, three females) were taken, among other Leucanid moths, by Paymaster-in-Chief G. F. Mathew, "on the coast of Suffolk and Essex," in the summer of 1895. Seven other specimens were secured by Mr. Mathew in 1896 (June 23rd to July 3rd). Six years later he captured five males, and saw a female, which flew off the sugar when he tried to box it. In recording the latter specimens he states that *favicolor* "is easily recognized, as it sits with its wings raised, whereas *pallens* closes them tight, and is much more quiet" (Ent. Mo. Mag. xxxviii. 220). At Harwich, in June, 1903, Mr. Mathew obtained a fine series, which was submitted to the late Mr. C. G. Barrett, who wrote (Ent. Mo. Mag. xl. 61):—"These specimens give me a far more extended idea of this pretty species and its variation than we previously possessed. From the soft, smooth, honey colour of the typical form these show the fore wings tinged with red-drab in a less or greater degree, till a deep red, almost a coppery-red, is reached, with a gloss and smoothness very different from the dull and plain appearance of the allied species, and decidedly so from the more pinkish red appearance of some forms of *L. pallens*, in which also are always closely placed lines all over the fore wings. Moreover, these *L. favicolor* maintain the greater breadth of the fore wings, and the decidedly more robust habit of the body. Still more interesting than these red specimens are two or three in which the fore wings are of a distinctly light yellow,* almost the colour of *L. vitellina*."

If at any time *favicolor* was restricted to the Harwich and Felixstowe districts it would seem to have extended its range since 1903. Mr. Waller, then living at Henley Rectory, Woodbridge, secured a specimen of ab. *rufa*, Tutt, that was attracted by light into his room in September, 1904; and in the following year he captured four specimens, three of which (one *lutea* and two *rufa*) came to sugared flowers of dock in July.

In 1906, Lieutenant Jacobs recorded red and yellow forms from the salt-marshes near Queenborough, Isle of Sheppey. In 1908 *favicolor* was taken at Benfleet, Essex, and a specimen "near ab. *lutea*" in East Sussex. At a meeting of the South London Entomological and Natural History Society, November

* Ab. *lutea*, Tutt.—R. S.

25th, 1909, Mr. Newman exhibited a Leucanid moth, taken at Cranleigh, Surrey, that had been identified as *favicolor*, as *pallens*, and also as *straminea*. The specimen had been examined by genitalia experts, who reported that the specimen was certainly not *straminea*, but whether it should be referred to *favicolor* or to *pallens* they were unable to say. Mr. Edelen (Entom. xliii. 34) records a specimen of *favicolor*, labelled "Hackney Marshes, 2. vii. 05," that he detected in a series of *L. pallens*, ex coll. Clark.

In a detailed account of the life-history of *Leucania favicolor* (Ent. Mo. Mag. xli. 77), Mr. Mathew compares the larvæ of *favicolor* with those of *pallens*, but up to the half-grown stage found very little difference between them, except that the former were of a rather "warmer colour, less attenuated, larger, and more plump." In their last skin the larvæ of *favicolor* were "cylindrical, short, and plump, very slightly attenuated towards each extremity, and their general colour was of a warm reddish ochreous, and more resembling the larvæ of *lithargyria* than those of *pallens*, which are always of a more or less cold greyish or putty colour with very slight tints of ochreous. The larvæ of *favicolor*, moreover, are considerably larger than those of *pallens*, which are also much more attenuated, and more slender" (p. 106).

Mr. A. W. Bacot, to whom eggs of *favicolor* were sent by Mr. Mathew, states in the same paper (p. 134) that he carefully compared the larvæ of *favicolor* with those of *pallens*. He could find no trace of difference in structure, nor in markings, only some divergence in the general colour; but here, he remarks, "one was met by the difficulty of discriminating between how much was individual and how much specific variation, as there was considerable variation in this respect in the larvæ of each batch."

With regard to the male sexual organs, important in questions affecting specific rank, the opinion of Mr. F. N. Pierce may be quoted. Referring to the type specimen of *favicolor*, he states: "I can see no difference in the form of the genitalia of this and *pallens*, except that *favicolor* is larger" ('Genitalia of the Noctuidæ,' p. 27).

In the foregoing notes the more important facts connected with *favicolor* are presented in the hope that entomologists in a position to do so will endeavour to ascertain the insect's true status. To arrive at anything definite in this matter it would, of course, be necessary to rear *favicolor* from the egg, and to have knowledge of both parents. The rearing of *favicolor* from ova of *pallens*, or of *pallens* from eggs of *favicolor* is strong presumptive evidence of the male parent having been *favicolor* in the one case and *pallens* in the other; still, it would be more conclusive if the male was known in each case. Mr. Crocker,

of Gillingham, Kent, writing to me in reference to *favicolor*, remarks:—"In their habitat it is quite common to take *favicolor* and *pallens* in cop. I have three such pairs taken this year [1911]; also a few insects which I am unable to place either with *favicolor* or *pallens*." Perhaps other entomologists may have also met with such cross-pairings when in search of *favicolor*; if so, it is very desirable that the observation should be recorded.

LEPIDOPTERA OF THE SWEDISH PROVINCES OF JEMTLAND AND LAPLAND.

BY W. G. SHELDON, F.E.S.

(Concluded from p. 27.)

Callophrys rubi.—Worn specimens were frequent at Mattmar.

Chrysophanus amphi-damas var. *obscura*.—Abundant at Mattmar; some of the examples even at the time of my visit, June 4th, were worn, but there was a good percentage of newly emerged ones; the butterfly was most abundant amongst willow thickets on the edge of the swamps, flitting about the bushes with a very *Thecla*-like flight, and settling on them from time to time. I found ova not infrequently on the under side of the leaves of *Polygonum viviparum*.

C. phlæas var. *hypophlæas*.—I found a single perfect example of this fine form at rest on a bent of grass, at Narvik, on July 19th.

Plebius argyrognomon var. *ægidion*.—First seen at Abisko on June 29th, after which date it became common on the banks of the tributary of the Abiskojokk, where Mr. Rowland-Brown found it in 1906, and which is in the park, but I did not see it elsewhere.

Polymnatus optilete var. *cyparissus*.—The first example was captured on June 29th: it was not common, but I did not work for it, and only brought a few specimens home.

P. icarus.—One female of the *cærulea* form was taken on July 16th: probably the species was only just emerging at the time of my departure from Abisko.

Aglais urticae.—Larvæ were very abundant at Åre, a few of which I took to Abisko; they pupated there, and emerged on my way home; the whole are very full-coloured specimens, with the central spots large, and one is distinctly var. (ab.?) *polaris*. As Abisko was until a few years ago absolutely without cultivation, I scarcely expected to see this species there: however, a few days after my arrival I came across two battered imagos, and thereupon made a search for nettles, a few patches of which I succeeded in finding, in the proximity of some ruined buildings; one patch in a sunny corner was covered with several hundreds of larvæ, a number of which I brought home. These produced some fine var. *polaris*, which emerged from August 8th to August 18th.

Brenthis aphirape var. *ossianus*.—This species was common at Mattmar, and less so at Abisko. It is essentially a swamp species, and I did not see a single specimen on other ground; one of my examples

from Abisko is without silver on the under side, and in this respect resembles the type; but it has the bright red blotches beneath which characterise var. *ossianus*, and is thus intermediate between that form and the type. First seen at Abisko, on July 12th. Herr Spröngerts informs me he found it at Narvik on July 20th.

B. pales var. *lapponica*.—This species was noticed at Abisko on July 3rd, but was not common at the date on which I left; probably it was not then fully out.

B. freija.—A few worn examples were seen flying over the bog at Mattmar, and on my arrival at Abisko the species was fully out there and in good condition, and it remained so almost until the time of my departure. It was not very abundant, but I usually obtained about half a dozen examples on each sunny day. This species is purely a bog insect; the males frequented at Abisko the low-lying swamps, probably attracted there by the warinth and shelter from wind. The females were chiefly found higher up the hill-sides. I confined several females on different plants, with a result that I obtained three ova; these unfortunately vanished one day out of the pill-box I kept them in, I suspect in consequence of the attentions of an inquisitive chambermaid. They were deposited on the stems of *Arctostaphylos uva-ursi*, which I give as a possible food-plant. Almost certainly the food-plant is not *Viola*, the only species of which I saw at Abisko being *Viola biflora* and *V. palustris*; the latter is rare, and although the former is locally plentiful in the birch forest, *B. freija* is not found there, except as a straggler; practically the only plants growing when I saw most of the females were *A. uva-ursi* and several species of *Vaccinium*. I do not think any of the Scandinavian Brenthids are violet-feeders, except possibly *B. thore* var. *borealis*, for that was the only species I saw flying amongst these plants, or in the neighbourhood of ground on which they occur. The ova is of a dark straw colour when newly deposited; it has a glazed surface, that portion held next the light being iridescent; it is funnel-shaped, wider at one end than at the other, and the ends are rounded; the surface is ribbed longitudinally, the ova were attached by the narrow ends to the stem of the plant on which they were deposited. The flight of the imago is very irregular, but not fast; it does not appear to frequent flowers, but one often disturbs it from the ground. It looks very dark on the wing for a Brenthid. The form of this species occurring at Abisko is sometimes described as var. *pallida*, Elwes. This is an error. Certainly some of the examples are rather light, but amongst my series of about fifty specimens there is nothing approaching the types of the *pallida* in the British Museum Collection, which were taken in the Altai Mountains by Mr. Elwes. The only striking variation in my series is that one male has the space between the central black transverse line, and that nearer the base of the front wings, almost filled in with black; this is evidently a recurrent form, for I saw other specimens, and might thus be called *ab. fasciata* n. ab.

B. frigga.—This handsome species frequents the bog at Mattmar, where I found it not uncommonly; in three days of intermittent sun I netted thirteen fine examples, including three females. It has much the same habits as the preceding species, but has a much

steadier flight, and looks larger and brighter-coloured on the wing. Tutt says ('British Lepidoptera,' vol. ix. p. 30) that "this species is only recorded as feeding on *Rubus chamaemorus*," a very abundant plant at Mattmar.

B. euphrosyne.—Very abundant at Mattmar—in fact, the most abundant butterfly there—and a few examples were netted at Abisko. At Mattmar it frequented the rising ground at the edge of the swamps. The great majority of the specimens seen were certainly not var. *finjal*, though they were slightly darker than the type, and one or two were so clouded with dusky scales that they approached the variety, but they were not so dark as examples of it I saw in the National Collection at Stockholm and in the British Museum Collection. The Abisko specimens were quite typical. I also captured one female at Narvik on July 19th.

B. thore var. *borealis*.—This species, which Mr. Rowland-Brown found abundant at Abisko, was this year quite rare; probably it was not out at the date of my departure. It was first observed—a single specimen—on July 10th. I obtained a pair on July 16th, and I believe my German friends accounted for half a dozen examples on July 12th.

Erebia lappona.—Common at Åre, and equally so at Abisko, where it was certainly the most widely distributed and abundant butterfly. The forms from both localities are similar. On the under side of the hind wings some of the specimens have a strong tendency to lose the transverse lines = ab. *pollux*, though none of them quite do so. On the other hand, one of the females has the space between these lines filled in with dark coloration. The upper sides closely resemble my Swiss specimens, except that in the majority of cases the hind wings are entirely without ocelli, though in one or two instances these are well developed.

E. ligea var. *adyte*.—A few examples were seen up the valley of the Abiskojokk, from July 10th onwards; the ocelli in these examples are very small, and the red bands in which they are placed narrow. A specimen netted at Narvik, on July 19th, has the ocelli very large on both fore and hind wings, and the red bands broad; it is quite the brightest banded example I possess from any locality. Both this and the Abisko specimens are small, expanding only 44 mm.

E. embla.—This species is said by Scandinavian entomologists to be only found commonly every alternate year, occurring freely in the even years, I was therefore not sanguine of meeting with many specimens. In this apprehension events proved that I was right, for I saw at Mattmar two examples only, one of which, a male in fair condition, I captured. *E. embla* is, I believe, in an average season, to be found during the last few days of May.

Eneis jutta.—I was unfortunate in only seeing one example of this species, which rose heavily out of the grass at my feet in the Mattmar Bog on June 5th; it was a female of large size, expanding 62 mm., freshly emerged, but slightly crippled. I searched carefully and widely for further specimens, but without success, and can only suppose that the species was not fully out, though it should have been according to the records of previous observers.

Æ. norna.—I obtained in all thirteen examples of this species; the first, a male, on June 25th, another male on June 29th, and a female on July 3rd. These were obtained on the rough ground fringing the swamps east of the Abiskojokk. On July 7th, at Ortojokk, on the north side of the Torne Träsk, I found the species common, and obtained eight examples during a short period of sun. They were flying over some grassy slopes, which had a plentiful outcrop of rock, just above the tree line. On July 12th I obtained two specimens on the west side of the Lapp Porten, on similar ground to that on which I found the species at Ortojokk.

There are several forms amongst this series which can perhaps be best described as follows:—

(a) Two males and two females. Bases of all wings dark brown, with tawny hind marginal band, two ocelli on each front wing, one on each hind wing = *norna*, Thnb.

(b) One male and one female, with ocelli as type, but with bases of wings in male pale brown with greyish tinge and hind marginal band pale buff; in the female the brown is almost lost, and the buff tint is consequently spread over the whole wing area = *ab. pallida*, n. ab.

(c) Two males as type, but with one ocellus on each of front and hind wings = *ab. hilda*, Quens.

(d) One female with one ocellus on each wing, and with the coloration of (b) = *ab. hilda pallida*, n. ab.

(e) One male and one female with the coloration of the type, and with two ocelli on front wings, hind wings being without ocelli = *bipupillata*, n. ab.

(f) One male with the coloration of the type, and with one ocellus only on each of the front wings, hind wings being without ocelli = *unipupillata*, n. ab.

(g) One male with the coloration of the type, all wings being entirely without ocelli = *obsoleta*, n. ab.

Æ. bore.—Flying with *Æ. norna* on the slopes of the Lapp Porten. I captured one male and one female of an *Æneis* which compare exactly with description of this species by Kane and Lang, and which are identical with specimens of it in the National Collection at the British Museum labelled "Sydvaranger." Bearing in mind that specimens of this and the preceding species occur on the same ground at Abisko—and that *Æ. bore* is superficially simply a grey Arctic form without ocelli of *Æ. norna*, which varies greatly in the number and measurement of ocelli, and has at Abisko grey forms, those from the south having the greatest number of ocelli, which gradually decrease in number as one goes north—I should be inclined to suggest that the two form one species. But I am confronted with the statement by Mr. Elwes in the Entomological Society's 'Transactions,' 1893, that the claspers are quite distinct. The matter must, I think, remain undecided until both species or forms have been bred from ova.

Hesperia centaurea.—I disturbed one fine example of this species from the bog at Mattmar on June 6th, and obtained half a dozen others at Abisko; these were taken on the grassy drier portions of some swamps on the east side of the Abiskojokk, about two kilo-

metres back from the lake, and on the rising ground (beyond the forest) on the way to the Lapp Porten. The first specimens were taken on June 25th, and the last on June 30th.

H. andromedæ.—A "Skipper" netted on the swamp between Abiskojokk and Björkleiden on June 23rd, and supposed at the time to be *H. centaureæ*, and two others taken with specimens of that species on June 30th, near the Lapp Porten, turn out to be undoubted examples of this species.

Augiades comma var. *catena*.—This species was common on the steep right bank of the Abiskojokk and on the banks of the tributary flowing into it on the west side, which was worked by Mr. Rowland-Brown in 1906. It was first seen on July 2nd. This brook, on the banks of which are found certainly more butterflies than on any other spot near Abiskojokk, is the first one on the left bank above the railway bridge; it can be seen from the hotel, high up in its course as a waterfall.

Amongst the Heterocera not a great number of species were seen at Abisko. There were a good many Geometræ, chiefly *Acidalia fumata*, *Larentia cæsuta*, *Coremia minutata*, and *Emmelesia albulata*. Of night-flying Noctuæ I did not see a single specimen; but amongst the day-fliers the beautiful little *Anarta melaleuca* was to be startled off rocks commonly, *A. cordigera* and *A. melanopa* also occurred, and *Plusia hochenwarthi* was not uncommon on the banks of the tributary of the Abiskojokk. On July 12th I found *Zygena exulans* var. *vanadis*, a fine form, abundant on the high ground approaching the Lapp Porten.

ADDENDUM.—Since writing the above my attention has been drawn to the fact that, in addition to the articles on Scandinavian Lepidoptera enumerated on pp. 357 and 358, vol. xlv., there is one in Ent. Mo. Mag. xxxvii. p. 24, by K. J. Morton, F.E.S., entitled "Trichoptera, Neuroptera, Planipennia, Odonata, and Rhopalocera, collected in Norway in the summer of 1900."

Youlgreave, South Croydon: August 21st, 1911.

NEW SPECIES OF BOARMIINÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

Ectropis brevifasciata, sp. n.

♂. Pale brown finely sprinkled with darker, a large purplish brown patch or short band on each wing. Fore wings with four transverse lines, the first preceded by a purplish brown cloud towards dorsum, and the third indicated by black dots on the veins; the second line purplish brown, indistinct; the fourth line (subterminal) pale, wavy, edged with purplish brown below the costa, above the middle and towards dorsum; lower half of space between third and fourth lines almost entirely filled in with purplish brown. Hind wings with three transverse lines, the first dark brown, indistinct; the second dark brown, dentate except towards costa where it is

represented by dots on the veins; third line (subterminal) pale, wavy, indistinct towards costa, edged with dark brown towards dorsum; lower half of space between second and third lines partly filled in with purplish brown. Under sides paler, the purplish brown patches of upper side indicated in fuscous.

Expanse, 40 millim.

Collection number, 1590.

A male specimen from Kanshirei, July, 1908.

Ectropis trilineata, sp. n.

Fore wings pale brown, mottled and suffused with darker; ante-medial line black, sinuous; discoidal mark black; medial line black, deeply excurved beyond cell, obtusely angled above dorsum; post-medial line black, slightly angled below costa and肘ed opposite cell; space between medial and postmedial lines pale; subterminal line pale, wavy, indistinct, inwardly edged with blackish on the costa, followed by a blackish cloud about middle; terminal line black, interrupted; fringes ochreous brown, marked with blackish. Hind wings whitish, powdered with brownish; discoidal dot brownish; ante- and postmedial lines brownish, only distinct on the dorsal area; terminal line blackish, interrupted; fringes pale brown. Under side rather paler; basal area of fore wings up to medial line suffused with fuscous; postmedial line of hind wings more distinct.

Expanse 32 millim.

Collection number, 810.

A male specimen from Arizan (7300 ft.), September, 1908.

Near *E. nigrilinearia*, Leech, from Western China.

Alcis plebeia, sp. n.

♂. Fore wings pale greyish, finely powdered with black, basal and medial areas slightly tinged with ochreous; costa paler, striated and spotted with black; antemedial line blackish, originating in first black spot, angled below costa, marked with black on median nervure; medial line black towards costa, uniting the discoidal mark with second costal spot; postmedial line, from third costal spot, blackish, serrate, outwardly edged with clear ground colour, indistinct towards dorsum; subterminal line whitish, crenulate, bent inwards at vein four, inwardly shaded and clouded with blackish; terminal line indicated by black dots between the veins; fringes whitish, marked with dark grey at the ends of the veins. Hind wings agree in colour with fore wings, but the ochreous tinge is fainter and confined to medial area only; three blackish transverse lines, the second more distinct towards dorsum, the third corresponding with the sub-terminal of fore wings; terminal line black, crenulate; fringes dark grey, paler tipped. Under side whitish, the margins, especially of fore wings, clouded with blackish: all wings with black discoidal dot and blackish postmedial line, the latter dotted with black on the veins.

Expanso, 42 millim.

Collection number, 1589A.

One male from Arizan (7800 ft.), July, 1908, and another (the type) from Rantaizan (7500 ft.), May, 1909. In the Arizan specimen the fore wings are less powdered and clouded with black than the type.

Alcis formosana, sp. n.

Fore wings pale brown, powdered and striated with darker brown; costa striated with dark brown; antemedial and medial lines black at extremities, but indistinct between; postmedial line black, dentate, outwardly edged with ochreous; subterminal line pale, wavy, edged inwardly with black at costa above middle and towards dorsum; two series of black dots beyond, one of which is on the termen; the dorsum is tinged with ochreous, and there are faint streaks of the same colour on or between the veins from postmedial line to termen. Hind wings whitish brown, basal third thickly sprinkled with dark brown, except on costal area; antemedial line blackish, rather broad; medial line blackish, dentate, outwardly edged with ochreous; postmedial line blackish, wavy, outwardly edged with the ground colour; area beyond medial line heavily sprinkled with dark brown; double series of black dots as on fore wings. Under side pale brown suffused with fuscous, costa striated with dark brown; all the wings have a black discal spot, that on the fore wings rather large; postmedial line on fore wings represented by black marks on the veins; a blackish cloud-like subterminal band; medial line on hind wings blackish, dotted with black towards costa.

Expanse, 64 mm.

Collection number, 1537.

A male specimen from Arizan (7800 ft.), August, 1908.

Allied to *A. roboraria*, Schiff.

Alcis obliquisigna, sp. n.

♂. Fore wings whitish, rather silky, powdered and clouded with brown, especially on basal and terminal thirds; antemedial line black, only distinct on costa, median nervure, and towards dorsum, where it joins an oblique black streak; postmedial line black, dentate from costa to vein five, thence undulate to dorsum, where it terminates in a black quadrate spot; subterminal line dusky, indistinct. Hind wings agree in colour with fore wings; three transverse lines, the first and third brown, diffuse; the second black, very narrow towards costa, broadened on dorsum, followed by a brown shade-like band. Under side pale fuscous, silky; blackish discoidal mark and post-medial line on all the wings.

Expanse, 54 millim.

Collection number, 795.

A male specimen from Rantaizan (7500 ft.), May, 1909.

Allied to *A. roboraria*, Schiff.

Alcis nigranotata, sp. n.

♂. Fore wings grey-brown with slight reddish tinge; basal band black, interrupted at vein one; antemedial line blackish,

marked with black on costa and median nervure, connected with a quadrate black spot on dorsum; discoidal mark black, linear, black dot above it on the costa; postmedial line blackish, sinuous, marked with black on the veins; subterminal line pale but indistinct, a conspicuous black spot on inner edge at vein five, and some smaller black marks towards costa; black lunules on termen connected by thin black line. Hind wings whitish, terminal third suffused with brownish; discoidal spot black; postmedial line indicated by black dots on the veins; tornal half of dorsum greyish marked with black. Under side whitish, slightly ochreous tinged, except on dorsal area of the fore wings; markings similar to those of upper side on the hind wings; on the fore wings the terminal area is blackish from costa to vein two, enclosing a spot of ground colour between veins three and four, the postmedial line represented by black bars on the veins.

Expanse, 40-44 millim.

Collection number, 792.

One male specimen from Arizan (7300 ft.), September, 1906, and one from Rantaizan (7500 ft.), May, 1909.

The species closely approaches *A. semialba*, Moore.

Alcis (?) *costimacula*, sp. n.

Head, thorax, and abdomen dark purplish brown; abdomen slightly ochreous between segments; anal tuft ochreous. Fore wings dark purplish brown, slightly freckled with ochreous on costal area of basal two-thirds; ante- and postmedial lines indistinct, the latter indicated by a large ochreous spot on the costa, and a smaller one on dorsum; subterminal line ochreous, most distinct on costa and dorsum; discoidal mark black; fringes ochreous, marked with dark purplish towards tornus. Hind wings dark purplish brown; basal third flecked with ochreous; medial third ochreous, flecked and mottled with purplish brown, especially towards the costa; transverse lines indistinct; discoidal mark blackish; fringes flecked with ochreous towards tornus. Under side similar to the upper side, but the abdomen is pale ochreous, ringed with purplish brown.

Expanse, 40 millim.

Collection number, 1591.

A male specimen from Sui sha (2000 ft.), July, 1908.

Apophyga nigrofusa, sp. n.

Fore wings whitish, suffused with blackish on basal two-thirds, sprinkled and mottled with brown and ochreous brown on outer third; subbasal and antemedial lines darker, but not clearly defined; postmedial line black, incurved from costa to vein six, where it is angled, thence oblique to dorsum, above which it is bent inwards; space between postmedial and dark basal area of the ground colour finely flecked with brown; subterminal line black, irregularly waved and edged with white; a blackish cloud on termen below apex, and one on the inner edge of subterminal line about middle. Hind wings whitish, fuscous tinged, sparingly powdered with brownish; discoidal spot and postmedial line blackish, the latter most distinct on the dorsal area; traces of a dusky subterminal line;

fringes ochreous brown, preceded by interrupted black line. Under side paler, markings of upper side faintly shown on fore wings.

Expanse, 56 millim.

Collection number, 806 B.

One example of each sex from Arizan, August, 1908.

The female has the basal area of fore wings almost devoid of scales. On the hind wings the discoidal spot and postmedial line are indistinct, but there is a dusky spot on terminal area between veins four and six.

Arichanna (?) *nigrifasciata*, sp. n.

Fore wings pale ochreous, suffused with olive; veins flecked with white; antemedial line black, interrupted above and below median nervure, outwardly edged with white, and followed by a black band which is broadest on dorsum; postmedial line black edged with white, broad on costa, and represented by dots on veins three to five; subterminal line white, wavy, interrupted, black spots on inner edge at each extremity and between veins four and six; termen clouded with black towards apex and tornus. Hind wings pale ochreous, finely flecked with black, inclining to greyish on basal area; discoidal spot and medial line blackish, the latter dotted with black on the veins, and faintly edged with whitish; subterminal band indicated by a black mark on costa, a large black spot between veins six and four, and a black curved streak from vein three to dorsum near tornus; black dots on termen between the veins. Under side similar but paler.

Expanse, 39 millim.

Collection number, 804.

A female specimen from Arizan (7300 ft.), August, 1908.

Gnophos punctivenaria taiwana, var. nov.

Formosan specimens are rather darker in marking than those from Western China. The space between ante- and postmedial lines is whiter, especially towards the costa; subterminal line whiter and more distinct.

Collection number, 1589.

Two male specimens from Rantaizan (7500 ft.), May, 1909.

RHYACIONIA (*RETINIA*) *PURDEYI*, DURRANT, AND
R. LOGÆA, DURRANT.

By RICHARD SOUTH.

In the 'Entomologist's Monthly Magazine' for November, 1911 (vol. xlvii. p. 252), Mr. H. Durrant describes two new species of *Rhyacionia*, Hübn. (*Retinia*, Guen.). The specimens of *R. purdeyi*, eight in number, were submitted for identification by the Hon. N. Charles Rothschild. They were taken at Folke-

stone in July, 1911, by Mr. W. Purdey, who has very kindly presented four specimens, including the type, to the British Museum. This novelty, we are told, rests among needles of the Scots fir (*Pinus sylvestris*) in the daytime, but about dusk it flies from branch to branch.

The *Rhyacionia* described as *logæa* is the species from Scotland that has long been doing duty for "*Retinia*" *duplana*, Hübn., in our collections, and of these so-called "*duplana*" Mr. Durrant has examined some fifty examples. Curiously, the specimen figured as *duplana* (Barrett, 'British Lepidoptera,' xi. p. 40, pl. 476, fig. 2) has now become the type of *logæa*, Durrant.

In general appearance it is not unlike a small *R. sylvestrana*, but "the ferruginous apex of the wing and the slightly different direction of the fasciæ" distinguish it from that species.

In connection with the change in generic name introduced by Mr. Durrant in his paper, the following extracts and remarks may be permissible:—

On the opening page of vol. iv. of 'Illustrations of British Entomology, Haustellata' (1834), Stephens remarks, in a footnote:—"I propose to give at the end of this volume a synopsis of the indigenous Lepidoptera, agreeably to the arrangement and nomenclature of Hübner in his 'Verzeichniss bekannter Schmetterlinge,' 1816, whose arrangement, however, appears to be less dependent upon structure than upon the variations of marking and colour: his groups are therefore in many instances very artificial: nevertheless as his work has hitherto only been occasionally, and not in all cases correctly, referred to, I conceive an abstract of its contents, so far as relates to the British species, as divided and named, nearly twenty years since, may be useful."

In his treatment of the Tortricidæ, &c., Stephens used most of the 'Verzeichniss' names, in a subgeneric sense, but the result was not always happy, and sometimes misleading, as the following critical remarks by Fernald concerning the genus *Rhyacionia*, Hübn., will illustrate:—

"*Rhyacionia*, Hb., p. 379 [Verz. bek. Schm.], with five species under it (*hastana* Hb. (non L.); *buoliana* Schiff.; *gemmana* Hb.; *turionana* Hb.; and *ministrana* L.). On page 392 in the same work, Hübner established the genus *Eulia*, with *ministrana* L. the only species and type, thus eliminating this species from *Rhyacionia* Hb. The second and third names, *buoliana* and *gemmana*, represent one species, so that there are only three species left from which to select the type. Stephens, in his 'Illustrations,' page 178, adopted *Rhyacionia* for a subdivision of the genus *Orthotænia*, with *turionana* (*buoliana* Schiff.), *gemmana* Hb., and *bentleyana* Don. under it, but on page 180 he adopted *Rhyacionia* Hb. as a genus, with *hastana* L. the only species under it.

In accordance with Merton Rule No. 48, we should accept this last. This, however, is impossible, as the *hastiana* of Stephens is neither the true Linnæan species of that name nor *hastana* Hb., but is *ulmana* Hb. (see Stephens's List, p. 48).^{*} Hübner supposed his *hastana* was the Linnæan *hastiana*, as shown in his 'Verzeichniss,' p. 379, and also in his 'Systematisch-alphabetisches Verzeichniss,' page 61, 1822. As he spelled his *hastana* different from the way that Linnæus spelled his *hastiana*, the two names have been retained for these two species. We are obliged therefore, as the Stephens type of *Rhyacionia*, on page 180, is a species not given originally under *Rhyacionia*, to reject this and take the restriction on page 178, where *turionana* Steph. (non Hb.) *buoliana* Schiff.; *gemmana* Hb. (a synonym of the same), and *bentleyana* Don. (*schultzi* F.) are the only species given, and as the last was not given by Hubner, *buoliana* Schiff. becomes the type of the genus. Lord Walsingham names this same species as the type in the 'Annals and Magazine of Natural History' (7), vol. v. page 124, 1900" (Fernald, 'The Genera of the Tortricidæ and their Types,' pp. 9-10).

Buoliana, Schiff., has been generally accepted as the type of *Retinia*, Guenée (1845); the latter name, however, will have to be merged in *Rhyacionia*, Hübn. Meyrick ('Handbook of British Lepidoptera,' p. 471) places *buoliana* and its allies in *Evetria*, Hubn., but previous authors, by removing to other genera four of the five species standing under this generic name in the 'Verzeichniss,' left only *tedella*, Clerck, and this species therefore became, automatically, the type of *Evetria*, Hübn. According to Fernald, *Evetria* = *Eucosma*, Hubn., the type of which is *circulana*, Hübn., a North American species congeneric with *tedella*, Clerck. The last-named species, it may be mentioned, is referred by Meyrick to *Epiblema*, Hubn., the type of which was fixed by Stephens as *fænella*, L., but as this also appears to be congeneric with *circulana*, Hübn., *Epiblema* will be a synonym of *Eucosma*.

Type fixing by elimination, as exemplified in the cases of *Rhyacionia* and *Evetria* referred to above, is a process resorted to when the type of a genus has not been indicated by the original author. As we have seen, this method of ascertaining a type is not so simple as it may look.

Frequent name changing, whether generic or specific, is of course troublesome, not to say perplexing, but it appears to be inevitable. The modern trend of entomological action has been not only to uphold priority but to enforce it, so that in the present day the "law" is almost universally recognized by systematists. Some there are, certainly, who advocate exceptions and restrictions, but if we are ever to have anything approaching

^{*} 'List of the Specimens of British Animals in the Collection of the British Museum.' Part x. Lepidoptera (1852).—R. S.

finality in nomenclature, strict priority, without any qualification whatever, must prevail. There can be no question that the only method of securing even approximate stability is to ascertain with certainty not only the earliest legitimate names of species, but the true generic position of species in classification. Thanks to the untiring investigations of many able specialists, the time is probably not very far distant when we may be able to feel confident that, in the majority of cases at least, the last word has been written or said on both these important points, and that rock-bottom in such matters has been reached.

BY THE WAY.

"Hengistbury Head, as I have known it and cared for it, is at an end. . . . Hengistbury Head and the bit of wild and wet ground between the estuary of the river and the strange bastions and embankments of the great mass on the land side have been sold. . . . It is to be developed and improved. I foresee a row of new bungalows . . . a golf links . . . the Head itself crowned by a great hotel . . . Hengistbury will so soon be harnessed to civilization that the wild life of it is no more a thing to be secretive about. Its Natural History period is over . . . There is no other spot from the Old Harry Rocks to Hayling so alluring to those who value wild life in a wild scene as the great 'ham' immediately under the headland, and the flats and swamps there—the tract that belongs half to the land and half to the water." "I have never been to this place without seeing something worth remembering," says Mr. George Dewar in the 'Morning Post,' on the 6th ult., nor have we; and we shall deplore its loss to us, "when the new age begins there this year or next." All the Christchurch records of the fine maritime earwig, *Labidura riparia*, come from the base of this bluff, where we passed a lovely afternoon last June. Latterly it seems to occur in greater numbers further west.

The social supper given by "The President of the Entomological Society and other entomologists," at the Holborn Restaurant on the 16th, was a brilliant success. The one point to be aimed at was to perpetuate the delightful annual gatherings of entomologists of every class, exactly on the lines adopted for nearly thirty years by Mr. G. H. Verrall; whether this were achieved by a single individual, by a few persons inviting the rest, or by ticket, was entirely immaterial, and the middle course has been adopted for the first year. The accident of Mr. Morice taking the chair forms no precedent for future Presidents of the Society, with which and the Entomological Club the present arrangement has no official connection.

At a representative gathering of subscribers on January 3rd, ways and means were discussed, and it was found that the funds already amounted to sufficient to entertain fully the usual number of guests; and, in fact, a hundred and twenty could be seated. It was admitted that further subscriptions would come in when the movement became more widely known; those present were Rev. F. D. Morice (Chair), Collin, Waterhouse, Champion, Sich, Col. Yerbury, Gibbs, Rowland-Brown, Jones, Prof. Image, Morley, Rev. G. Wheeler, Adkin, Dr. Jordan and Turner. Neither a suggestion for forming a new social society for the perpetuation of the function, nor another for the extension of the Club limits, met with any support. It might be pointed out that special care should in future be taken to invite foreign and colonial entomologists temporarily residing in England. We failed to see either Maxwell Lefroy or N. B. Kinnear among the nearly one hundred who assembled on the 16th to drink standing and in silence to the memory of Mr. G. H. Verrall.

The acting Government Entomologist, Mr. C. French, gave us an interesting account and plate of the "Parasitic Wasp," *Megalyra fasciipennis*, in the December number of the 'Journal of Agriculture of Victoria,' pp. 818-9. He says they prey upon Longicorn Beetles and Buprestids, and the figured cross-section of damaged timber shows how destructive these insects are. *Megalyra* is not a true Ichneumonid, and the genus is now considered as a distinct family, well represented in the British Museum by three or four of the few known kinds from Queensland, Victoria, South Australia, and Tasmania. Mr. W. W. Froggatt has well monographed this small family in the Trans. Linn. Soc. N. S. Wales for 1906.

NOTES AND OBSERVATIONS.

HESPERIA MELOTIS, Dup. (HYPOLEUCOS, Led.).—Being at the moment engaged in an attempt to arrange the Western Palearctic Hesperiiids, I have on many occasions availed myself of the exhaustive accounts of the British species of this difficult group given in the late J. W. Tutt's 'Natural History of British Butterflies.' To the short article announcing Dr. Roverdin's discoveries relative to *H. malvæ* and *H. malvoides*, I added (*antea*, p. 7) that he had come to the conclusion that *H. melotis*, Dup., and *H. hypoleucos*, Led., were one and the same true species—a conclusion which I should have had no doubt whatever about accepting, had not Tutt described them separately (*Op. cit.* vol. i. pp. 229-230) as varieties of *malvæ*. The notice of *melotis* ends: "It occurs in May in the Tyrol and in Switzerland," and the author proceeds: "We are inclined to refer to Duponchel's variety (*sic*) only those dark examples from the eastern

Alps (the most brilliantly marked form of the species found in Central Europe); some of the finest of these that we have seen came from Locarno" Now *melotis*, or *hypoleucos*, occurs in Andalusia, where Rambur found and described it (Cat. Lepid. And. p. 76, 1858), and in the island of Milo, probably other islands of the eastern Archipelago, and in Syria; and I was vainly endeavouring to reconcile with it Tutt's var. (et ab.) *melotis* "from the Tyrol and Switzerland (Duponchel)" when I received an unexpected and surprising solution of the problem from Dr. Reverdin, to whom I am indeed greatly indebted for the information. The translator of the original description faithfully transcribed the notice of *melotis* in Duponchel's "Hist. Nat." Supp. i. p. 257, down to the bottom of that particular page. He then inadvertently turned over the following two pages, with the intervening plate xlii., and copied—"It occurs in May in the Tyrol and Switzerland" from the concluding sentence of an account of *H. alveus*! I can only suppose that Tutt himself never examined Duponchel's figure of the species, or the series of *H. melotis* (*hypoleucos*)—some of the specimens Lederer's own—in the South Kensington collection; perhaps even they were not available when he wrote his article on *malvae* and its vars. However, Dr. Blachier, of Geneva, sometime since detected this remarkable oversight, and it would now appear necessary, therefore, not only to strike out var. *malvoides*, Elw. and Ed.; var. *alpina*, Tutt; and var. *pyrenaica*, Tutt, as varieties of *malvae*, but to dissociate *melotis*, Dup., and *hypoleucos*, Led. from any such immediate connection with our one British *Hesperia*. Further, allowing for the wide separation of Duponchel's (and Lederer's) *melotis* in the Greek Archipelago, and Rambur's *hypoleucos* in Southern Spain; a break of continuity paralleled in the case of *Zegris eupheme*, South Russia, and (var. *meridionalis*) Andalusia; and *Hipparchia hippolyte*, Sierra Nevada and the Urals; the slight differences in the descriptions of *melotis* and *hypoleucos* by their respective authors amount to no more than might be expected of regional forms of the same species occurring in such widely distant localities. How Tutt squared his Locarno examples with Duponchel's *melotis* I do not know; at all events Duponchel's types were not derived from North Italy or Switzerland—that is clear.—H. ROWLAND-BROWN; Harrow-Weald, January 15th, 1912.

METOPUS DENTATUS, Fab., AND SPHINCTUS SEROTINUS, Grav. (Bred).—Thanks to Mr. Claude Morley's newly published volume of Ichneumons, I have identified these scarce ones amongst others bred at various times, now in my collection. When collecting at Roman Bridge, North Wales, during August, 1902, I came upon a number of full grown larvæ of *Lasiocampa quercus*. These soon pupated after my return home, and in the following spring five male specimens of *Metopius dentatus* and three *Sphinctus serotinus* emerged from the cocoons? As it seemed odd to rear such different looking ichneumons, I fortunately kept them, not knowing what they were. Since reading Mr. Morley's account of their habits, I begin to doubt my notes and to think it possible some cocoons of *Limacodes testudo* may have been in the same breeding cage, as I find I took some larvæ at Westerham in 1902. As these ichneumons all emerged within a few

days, I certainly then thought that they all came from *L. quercus* cocoons, but I may have been mistaken. One specimen of *serotinus* has the base of segments of abdomen black, with apices only yellow.—E. B. NEVINSON; Moorland, Cobham.

[Only seven specimens of *Sphinctus* were known as British, and such records as Mr. Nevinson's go to show how little incentive is necessary to induce our entomological observers to record species hitherto considered of the greatest rarity, with the result that knowledge of the neglected groups is instantly broadened. No doubt can, I think, be entertained that the above examples emerged from *Limacodes*, its only known host; *Sphinctus* is a solitary parasite, and *L. quercus* seems too large a host for its comfort.—C. M.]

SPHINX CONVULVULI AND ACHERONTIA ATROPOS AT EASTBOURNE IN 1911.—*Sphinx convolvuli* appears to have been fairly common at Eastbourne during September of last year; my own acquaintance with the species consisted in finding a very worn specimen at rest on a fence near the sea on the morning of the 18th, but my friend, Mr. Sharp, informs me that two were found at rest on the beach by the bathing machine proprietor and brought to him; one was taken flying over flowers of tobacco plant, and another from a street lamp near his house. Of six that fell to the lot of another collector, three were taken at rest about the roadways, and one from a sheet hung out on a clothes line to dry; while yet another half dozen are accounted for by Mr. Chartris, most of them taken at rest in various parts of the town; he also took two larvæ, the first found crawling in the roadway, and the other by searching the food-plant in the vicinity, which was found to be much eaten; one of them went to earth but failed to pupate, the other was given by him to a friend, but how it fared is not known. An example of *Acherontia atropos* was found among some boards in the town in October last while they were being removed, and another was reared from a pupa found at Wannock.—R. ADKIN; Lewisham, January, 1912.

SECOND BROOD OF APATURA IRIS, &c.—Last September, when moving a sleeve containing thirteen larvæ of *A. iris* (from the wild), I noticed that one had outgrown the hibernating size. This one continued to feed up slowly. About the middle of October, owing to the cold weather and condition of the foliage, I brought it indoors. On November 4th it pupated, and a rather small female emerged on November 29th. Other species bred as a second brood, all reared under natural conditions, were *Argynnis selene*, *Boarmia consortaria*, *Tephrosia crepuscularia*, ab. *delamerensis*, *Angerona prunaria* (two only out of a large number, both very small females), *Acidalia aversata*, and *A. subsericeata*.—EDWARD GOODWIN; Canon Court, Wateringbury, January 13th, 1912.

COLIAS HYALE IN HANTS, 1911.—Though rather late in the day, it may be of interest to mention that my son caught a female *C. hyale*, on August 14th last in the New Forest, near Lyndhurst. I should be glad to know if many of this species were taken during last summer.—(Captain) W. G. MANLEY; 62, Albert Hall Mansions, S.W., January 10th, 1912.

End of August, near Lyndhurst, New Forest, I took two males and saw a female caught by a boy of *C. hyale* all in good condition.—(Colonel) R. H. RATTRAY; Tonbridge, Kent.

ARGYNNIS SELENE IN AUGUST.—I caught a specimen of *A. selene* on August 17th in fine condition and evidently of the second brood.—(Captain) W. G. MANLEY.

XANTHORHOË (MELANIPPE) FLUCTUATA IN DECEMBER.—On December 27th last I took on a fence in Southfields a perfectly fresh specimen of *X. fluctuata*, the weather at the time being abnormally mild.—A. E. HODGE; 14, Astonville Street, Southfields, S.W., January 2nd, 1912.

PHIGALIA PEDARIA NOTED FROM READING.—This species was out here on January 7th; my earliest previous dates were January 20th, 1895, and January 21st, 1887.—W. E. BUTLER; Hayling House, Oxford Road, Reading, January 13th, 1912.

LEPIDOPTERA IN THE TONBRIDGE DISTRICT, 1911.—The past year has been a very good one for moths around Tonbridge, Kent. Sugar was useless till after the middle of July. I caught the following moths around the electric lamps: *Apocheima hispidaria*, *Tæniocampa populeti*, *Notodonta trepida*, *Pygæa curtula*, *Pheosia tremula*, *P. dictæoides*, *Acronycta leporina*, *Mamestra genista*, and *Cerura furcula*; specimens of the last-named species were taken on August 1st, 4th, and 6th, and were undoubtedly a second brood. On September 26th a fine specimen of *Acherontia atropos* was taken about 8 p.m. flying round a lamp, and on October 7th two pupæ of the same species were brought in to me by potato diggers; these emerged on October 17th and 22rd. Flying in garden after dusk I caught *Plusia iota*, *P. pulchrina* and five specimens of *P. moneta*, *Geometra papilionaria*, and *Epione apiciaria* (these latter were quite common). A few *Semiothisa notata*, many *S. liturata*, and a few *Boarmia consortaria* and *B. roboraria* were beaten out of trees and bushes. At sugar towards the end of July I took *Apamea ophiogramma* (3), *Caradrina morpheus*, *Triphæna interjecta*, *Plastenis subtusa*, *P. retusa* (2). During September and October also at sugar I took a long series of *Orrhodia vaccinii*, *O. ligula*, and *Eupsilia satellitia*, *Aporophyla luteulenta* (4), *Lithophane semibrunnea* (2). *Amathes lota*, and *Miselia oxyacanthæ* were particularly common throughout the autumn.—(Colonel) R. H. RATTRAY; 68, Dry Hill Pack Road, Tonbridge, Kent.

A BOOK SALE.—It is not often that a more interesting collection of entomological books has been brought together than was the case on Tuesday, January 9th, when the libraries formed by Mr. C. H. Schill, the late Mr. B. G. Nevinson, and the late Mr. T. Vernon Wollaston were offered at auction by Mr. J. C. Stevens at his King Street rooms. The highest price realized for any one lot was £37 for a complete set of the 'Transactions' of the Entomological Society of London, from the commencement in 1834 to 1901; 49 vols. in all; while another set commencing with 1836 to 1877 in 20 vols., and some unbound parts, brought £19. A set of the 'Annales de la

Société Entomologique de Belgique, vols. i-xli, 1857-97, sold for £6; '*Horæ Societatis Entomologicæ Rossicæ*,' vols. i-xxvii, 1861-93, £11; and two incomplete sets of the '*Annales de la Société Entomologique de France*,' the one of 35 vols. commencing with vol. iv. of the first series and covering the years 1835-6 and 1843-76, £6 15/-, and the other of 46 vols., 1870-1901, 1903 and 1905, £2. A set of 58 vols. and some parts of the (Stettiner) '*Entomologische Zeitung*,' 1840-1911, realized £6 6/-; the '*Entomologist*,' vols. i-v., 1840-71 and some unbound parts, £2 15/-; the '*Zoological Record*,' vols. i-xii., 1864-75, £2 10/-, and '*Novitates Zoologicæ*,' vols. i-vi. in parts 1894-9, £2 7/6. There was a good assortment of works on Coleoptera, among them Lacordaire's '*Genera des Coléoptères*,' 12 vols. and atlas of plates, 1854-76, 13 vols. in all, brought £3 10/-, and another copy, £5 15/-. Bestimmung's '*Tabellen der Europäischen Coleopteren*,' heft 1-64 (heft 12 and 23 missing), 1879-1908, £5; Gemminger et Harold, '*Catalogus Coleopterorum synonymicus et systematicus*,' 1868-76, 12 vols., £3 5/-; Gravenhorst's '*Coleoptera Microptera*,' 1802, with others, £3 12/6; '*Biologia Centrali-Americana*,' Insecta, Coleoptera, vol. ii., part 2, £2 17/6, and another copy, £3; vol. iii., part 1, £2 17/6, and vol. vii., £2 10/-. The only important work on Diptera, Meigen's '*Systematische Beschreibung der Europäischen Insekten*,' Zweiflügeligen Insekten, 7 vols., 1822-51, was knocked down at £3. Two copies of Westwood's '*Arcana Entomologica*,' 1841-5, 2 vols., brought £2 2/- and £2 4/- respectively, and his '*Thesaurus Entomologicus Oxoniensis*,' 1874, £3 15/-. Linnæus's '*Systema Naturæ*,' ed. xii., 1766-7, 2 vols. in 3, realized £1 17/6; Fabricius's '*Entomologia Systematica*,' 4 vols. and Supplement, 1792-8, £1 1/-; Rambur's '*Lépidoptères de l'Andalousie*,' 1858, £2; Boisduval's '*Monographie des Zygnides*,' 1829, with Staudinger's 1871 Catalogue, 8/-; and Gerhard's '*Monographie der Europäischen Lycenidae*,' 1853, £2 2/-. The '*Lepidoptera of Ceylon*,' a large folio volume of coloured drawings of butterflies and moths and their larvæ on seventy plates, brought £6 10/-, and among some of our more familiar books may be mentioned Stephens's '*Illustrations of British Entomology*,' 1828-46, 11 vols. and Supplement, which sold for £2 4/-; Wood's '*Index Entomologicus*,' 1854, £1 12/6; and Kirby's Synonymic '*Catalogue of Diurnal Lepidoptera*,' 1871, with Supplement 1877, £1 17/6. The sale was well attended, but we noticed very few of our entomological friends in the room, who, had they been present, might have picked up many a useful volume at the cost of a very few shillings from among the three hundred and fifty-five lots that were offered.—R. A.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, November 15th, 1911.*—The Rev. F. D. Morice, M.A., President, in the chair.—The Rev. Samuel Proudfoot, 6, Lyme Grove, Altrincham, Cheshire, was elected a Fellow of the Society.—Commander Walker exhibited

three specimens of *Phædrophilus o'connori*, Broun, a large and handsome weevil from Mount Quoin, Kaitoke, New Zealand, South Island. The specimens were taken by Mr. G. V. Hudson, F.E.S., of Wellington, New Zealand, at an elevation of 3900 ft., in December, 1910. Commander Walker also exhibited a specimen of the rare Tortrix, *Phalonia (Eupæcilia) implicitana*, Wocke, taken by Mr. H. G. Champion at Shoreham, Sussex, August, 1911.—Mr. W. C. Crawley, a female and a worker of *Leptothorax tuberum*, Fabr., subspecies *corticalis*, Schenk, new to Britain, found with two larvæ in an empty beech-nut at Pangbourne, Berks, April 24th, 1904. It was named by Forel as a var. with long spines.—Mr. N. S. Sennett, some Coccinellids (*Chilocorus bipustulatus*) as found on Mimosa trees at Mont' Estoril in Portugal, the small exudations of gum presenting what appeared to be a remarkable though hitherto unrecorded case of protective mimicry.—Mr. L. W. Newnan, a long series of *Pyrameis cardui*, bred from females captured at Folkestone on September 2nd last. Ova were laid at once and placed in a hothouse kept at about eighty degrees; they hatched on September 7th, and larvæ fed up very rapidly on stinging nettle, the first pupating on September 30th. Imagines started to emerge about a week later, and all were out by October 16th—some five hundred in all. Considerable variation occurred, but the majority of the brood were normal.—Mr. H. W. Andrews, two rare species of Diptera from North Kent, viz., *Syrphus lineola*, Ztt., a male, taken at Bexley on July 8th; and *Sciomyza simplex*, Flin., both sexes, taken in the Thames marshes on June 23rd and July 1st, all in the present year. Mr. J. E. Collin remarked that he had only taken the latter species at Ringwood and in Suffolk.—Mr. E. A. Cockayne, a Geometer taken at Tongue, Sutherland, July 5th, 1906, probably *Cidaria (Dysstroma) concinnata*, Steph., specimens of which were placed below for comparison.—Mr. J. Platt Barrett, a drawer of *Melanargia galatea* containing: English specimens, altitude under 500 ft., with one aberration. Specimens from the Alps, (1) Brigue, 2000 to 3000 ft., paler than (2) and probably larger; (2) Berisal, over 5000 ft., dark. From the Apennines, (3) Pracchia, near Pistoja, 3000 ft., the smallest form, dark. From Calabria, (4) Gioja Tauro, Plain of Radicena, near sea-level, large and very dark; (5) Palmi, Monte Elia, 1000 ft., very dark; (6) Aspromonte, above Scylla, over 2000 ft., very dark. From Sicily, (7) Mount Etna, over 3000 ft., moderate size, paler; (8) Monte Cici (near Messina), 2000 ft., large and dark; (9) Monte Scuderi, 1000 ft., very large and rather pale; (10) Messina (Gravitelli), 500 to 800 ft., large and dark (var. *procula*); (11) Megara Hyblæa, sea-level nearly, large and pale; (12) Syracuse, sea-level nearly (var. *syracusana*, Zell.).—Mr. A. E. Tonge, a gigantic spider (*Mygale*) from California.—Mr. J. R. le B. Tomlin, a specimen which he said was not strictly an entomological exhibit, but from its curious resemblance to a caterpillar might be of momentary interest to Fellows. It was in reality a species of West Indian oyster (*Ostrea frons*, L.) which attaches itself to twigs. Professor Poulton remarked that both this and the Coccinellid exhibited by Mr. Sennett were probably cases of accidental resemblance.—Professor E. B. Poulton, the following specimens sent to

him by Mr. C. F. M. Swynnerton, all of which had been captured on the outskirts (3800 ft.) of Chirinda Forest, Gazaland, South-east Rhodesia :—(1) The female form *hippocoön* of *Papilio dardanus cenea*, Stoll, rescued, September 8th, 1911, by one of his native collectors from a M'lange Bulbul (*Phyllostrophus milanyensis*). The head was wanting, and there were symmetrical injuries at the anal angle of the hind wings similar to those so often seen in living butterflies. (2) Two wings of *Precis archesia*, Cr., ☉, and the fragments of a Blattid, probably of the genus *Deropeltis*, taken June 25th, 1911, from a spider's web. Professor Poulton also exhibited specimens sent by Mr. J. C. Moulton from Sarawak, showing instances of mimicry, and read Mr. Moulton's account of them. Mr. C. J. Gahan had described one new species of *Daphisia* (*D. elytoides*).—Professor Poulton, six male examples of a remarkable Lycænid, all captured, November 22nd, 1910, in the Uhehe District (3000-3500 ft.) of German East Africa, by Mr. S. A. Neave, F.E.S. The pattern and brilliant colours, which were extraordinary in a Lycænid, strongly suggested on both upper and under surface the appearance, although on a smaller scale, of an *Acræa* of the type of *A. anemosa*.—Mr. Stanley Edwards, a specimen of *Oxynterus audouini*, a beetle from Borneo, with abnormal antennæ, apparently gynandromorphous, and explained that Mr. Gahan had dissected it and found the genitalia to be entirely female.—Mr. H. C. Dollman, the following species of Coleoptera :—*Philonthus intermedius*, Bois. ab. *donisthorpci*, Dollman, described in the Ent. Rec., December, 1910; *Stenus formicetorum*, Mann., introduced as British in the Ent. Rec., April, 1911; *Bembidium quadripustulatum*, Dj., an example from Ditchling, Sussex, August 17th, 1911; *Hypophlæus linearis*, F. retaken at Oxshott, in July of last year, a species hitherto taken in Great Britain only in Surrey, at Oxshott and Woking; *Mycetoporus forticornis*, Fauv. (one specimen from the New Forest), with *M. clavicornis* Steph., for comparison; *Philonthus corruscus*, G., taken from a dead rabbit at Ditchling; *Stenus morio*, Gr., from Ditchling, taken in October, 1910.—Mr. H. Eltringham, a bred series of *Acræa orestia*, Hew., containing the typical form and also the *A. humilis* of Miss E. M. Sharpe, thus demonstrating the truth of the conclusion at which he had previously arrived as to the specific identity of these two forms. He also showed three male black and yellow *Acræas*, one of which was the *A. circeis* of Drury, from Sierra Leone. The other two, while differing in appearance from *A. circeis*, were themselves exactly alike, but for the fact that the two tarsal claws of the second and third pairs of feet were equal and similar in one specimen and unequal and dissimilar in the other. A long and interesting discussion followed, on the question of the importance of the tarsal claws as a means of specific distinction, and on the possible correlation of uneven claws in the male, and the abdominal sac in the female.—Mr. Champion called attention to a paper by M. Roger Vérité, in the 'Bulletin de la Société Entomologique de France,' Séance du 11 Octobre, 1911, on new Scottish races of *Erebia aethiops*, Esp. (race *caledonia*), *Satyrus semele* (race *scota*) and *Pararge megæra* (race *caledonia*). The following papers were communicated :—"Descriptions of South

American Micro-Lepidoptera," by E. Meyrick, B.A., F.R.S. "New Species of Hawaiian Hymenoptera, with Notes on some previously described," by R. C. L. Perkins, D.Sc., M.A., F.E.S. "Notes on Hawaiian Hemiptera, with Descriptions of New Species," by R. C. L. Perkins, D.Sc., M.A., F.E.S. "Experiments in the Formation of Colonies by *Lasius fuliginosus*, females," by Horace Donisthorpe, F.Z.S. and W. C. Crawley, F.E.S.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The Annual Meeting was held at the Royal Institution, Colquitt Street, Liverpool, on December 18th, 1911.—Mr. Wm. Webster in the chair.—As Mr. W. J. Lucas, the retiring Vice-President, was unable to be present to read his address "On the Present State of our Knowledge of the Pre-imaginal Stages of the British Dragonflies," this was done by the Secretary.—Mr. Lucas dealt lucidly and in detail with the various methods of oviposition obtaining in the Odonata, drawing particular attention to the habit *Ischnura elegans* possesses of descending beneath the surface of the water for this purpose, and to the two types of dragonfly eggs—the elongate, cylindrical type such as is met with in *Aeschna*, and the more or less oval or pear-shaped type found in *Sympetrum* and *Libellula*. The development of the nymphs, their form, habits, and food, the duration of the nymphal existence, and other features of dragonfly binomics were then dealt with in an equally interesting and exhaustive manner; the fact being emphasized that, although of recent years a considerable amount of work had been done, and our knowledge of the life-history of these beautiful creatures had been greatly increased, there yet remained a vast amount to be done in the future. The latter part of the address consisted of a review of the progress of our knowledge of the earlier stages of dragonfly existence, commencing with Thomas Mouffett's 'Insectorum Theatrum,' and bringing the subject down to the present day. The address and the excellent lantern slides with which it was illustrated were greatly appreciated by all who were present.—Mr. C. B. Williams exhibited a box of Lepidoptera collected during the past season in various localities, and including the following:—*Teniocampa munda*, *Xylina socia*, *X. ornithopus*, *Xylocampa areola*, and *Oporina croceago*, from the Conway Valley; *Argynnis selene*, *Carterocephalus palamon*, and *Nemeobius lucina*, from Northamptonshire; *Boarmia roboraria*, *Gnophria rubricollis*, *Nemeophila russula*, *Macroglossa fuciformis*, *Lycæna ægon*, and *Argynnis euphrosyne* from the New Forest.—OSCAR WHITTAKER and WM. MANSBRIDGE, *Hon. Secs.*

OBITUARY.—With great regret we have to announce that Mr. SAMUEL JAMES CAPPER, of Huyton, Liverpool, passed away on January 22nd last. A biographical notice will appear in the 'Entomologist' for March.

THE ENTOMOLOGIST

VOL. XLV.]

MARCH, 1912

[No. 586

THE EARLY STAGES OF *EUSTROMA RETICULATA*.

BY FRANK LITTLEWOOD.

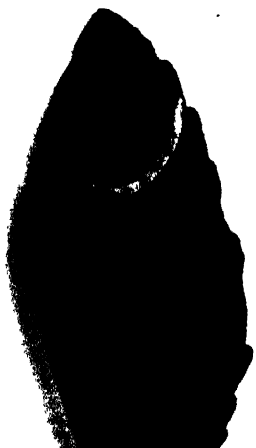


FIG. 1.



FIG. 2.

ASSUMING Mr. Prout to be correct in his belief that my observations of the early stages of *Eustroma reticulata* will be of general interest, I have pleasure in placing the same before the readers of the 'Entomologist.'

Seeing, however, that several years have elapsed since these notes were penned, and that I have found neither time nor opportunity for renewing my acquaintance with the species, it is necessary, perhaps, to state that the descriptions of both larvæ and pupæ were written down in my diary *at the time*, for in matters of this kind, where details are essentials, I have found one's memory to be, generally, delusive and unreliable. So that, whilst not pretending to scientific terminology, the following descriptions may be accepted as being, so far as they go, accurate.

Descriptions of Larvæ.—The smallest larva, taken on August 20th, 1905, and apparently only a few days old, was 4 mm., or five thirty-seconds of an inch in length. The majority, however,

were somewhat larger, and as they appeared to be only a further development of the same stage, one description will suffice. Length, 8 mm., or ten thirty-seconds of an inch. The natural colour of the body is a peculiarly transparent glossy white, and the texture of the skin reminds one more of a beetle-grub than of a lepidopterous larva. There are no markings on the body. Head and legs also of the same transparent white. On either side of the head is a group of six dark-coloured spots (ocelli), *i. e.*, an upper series of four and a lower series of two spots. Very fine hairs scattered over body and head (visible only under pocket-lens). Owing to the transparency of the skin, however, the actual colour of the body is determined by the food that is passing through the larva. If feeding on the leaves, the anterior segments appear pale green; if on the flower-petals, reddish yellow; if on the seeds, opaque white. The posterior segments are darker in colour, the effect of the digested food, and on looking at the larva against the light at least two separate pieces of frass are clearly discernible close to the anal extremity. A varied diet gives to the larva a somewhat striking appearance, and several, in confinement, where a variety of food was within their reach, exhibited a range of four distinct colours—the first portion of the body opaque white (seed); the next, yellow (petal); the next, green (leaf); the remainder, black (frass). The order of the colours varied according to the taste of the larva, and although this sort of thing would not happen in a state of nature, being simply the result of having the different kinds of food mixed up in the tin in which the larvæ were kept, still it is an interesting illustration of the lack of natural colouring pigment in the skin.

The largest larva, taken on the same day, August 20th, was 13 mm. or seventeen thirty-seconds of an inch in length. (This is the stage succeeding that already described.) Head and legs pale brown. Group of dark spots on head as before. General colour of body pale green. No trace of a medio-dorsal line. A faint white subdorsal line. Spiracles white and joined by a faint, hair-like white line. The incisions of the segments are white. Fine short hairs protrude from small black warts, distributed sparsely but regularly over the body. The spots on the head also each emit a dark hair.

The full-grown larva (described September 7th, 1905) is 25 mm., or one inch in length. Head and legs pale brownish green. The groups of spots on the head now show prominently and are quite visible without the aid of a lens. The body is thickest at the eleventh segment and tapers towards the head, which is narrow and flat. Natural colour of body pale transparent green and the skin not now glossy. There is an interrupted dull red medio-dorsal line, somewhat irregular in outline. This, starting behind the head, continues unbroken to the

end of the fourth segment, afterwards being visible only at the segmental divisions, where it appears as an elongated spot. At the anal end two such spots join to form a conspicuous red blotch. The amount of this coloured line varies greatly in different individuals. There is not the slightest trace of red on the sides of the larva. The fairly broad white subdorsal lines join below the anal aperture. Two broad white lines, continuations of the subdorsal lines, extend down the outside of the wide-spread anal claspers. Spiracles dull yellow, connected by a delicate hair-like white line. Body sparsely sprinkled over with minute black warts, each emitting a short black hair. These warts are arranged in circular series around the middle of each segment. Down the middle of the ventral surface is a narrow white line, broken at each segmental incision. In the full-grown larva the white segmental divisions are not so conspicuous. Colour of body still dependent to a great degree on the food, although the anterior portion of the body is now almost always opaque white, due to the full-grown larva's undoubted preference for the seeds.

Habits of the Larvæ.—The young larvæ are found usually resting in various positions on the under sides of the leaves of *Impatiens noli-me-tangere*, and their presence on a plant is denoted by numerous circular holes in the leaves. The majority appear to affect the midrib as a resting-place in the daytime, especially when "lying up" for a change of skin, and in this position are extremely like the narrow unripe seed-pods, which themselves lie along the midrib on the under side of the leaf. Several young larvæ, however, were found stretched at full length along the upper stems and amongst the flower-buds.

In confinement, where a variety of food was provided, the young larvæ fed indiscriminately on leaves, flower-petals, and flower-buds, but seemed to like the latter, which they hollowed out completely. The habit of drilling round holes in the food appears to be the natural instinct of the larva, and points, I think, to the fact of the seed being the proper food. I never observed a leaf eaten at the edge in the usual manner of leaf-eating larvæ.

In the last stage there is no doubt that the unripe seeds form the exclusive food of the larva, and I doubt much whether in confinement they can be brought to normal size if this diet is not provided for them. On several occasions, when my stock of seed-pods got low, I noticed the larvæ wandering about in a restless manner in search of food, and although fresh leaves were introduced, they refused to touch them, and consoled themselves with nibbling the curled-up pods from which the seeds had been expelled. The ripe pods burst at the slightest touch, and the loose seeds lying on the box-bottom were eaten readily. In a state of nature the *full-grown* larva has a very characteristic habit of resting in the daytime with the claspers

attached to the midrib of the under side of a leaf, about a quarter of an inch from the base of the leaf, and the body stretched downwards towards the main stem on which the fore legs rest. The main stem, the leaf-stem, and the larva thus form an obtuse-angled triangle, of which the larva is the longest and lowest side.

Occasional specimens are found attacking the pods during the day but the majority rest perfectly quiet till evening, when they wake up and exhibit considerable activity in their search for food. They eat voraciously and increase rapidly in size, the duration of the larval life being about a month. The larva loses its hold readily on being disturbed, and falls curled up with the head tucked in tightly.

At the cessation of feeding, the larva shrunk very considerably, and moved about in an apparently aimless manner, seeking a place for pupation. In confinement the majority spun a tough cocoon of sand and silk, attached to the moss which was laid on the surface of the sand. Several larvæ wrapped themselves tightly in the withered leaves of the balsam. Damp, and plenty of it, seems essential at this period to enable the larva to make a satisfactory change to the pupal state. A number of newly formed cocoons, which I removed to a dry tin on account of the decayed and mouldy state of the balsam, when opened contained crippled pupæ, the larval skin not having been completely shed. All those left in the original tin, amongst the wet food and moss, changed perfectly to fine pupæ.

Full-fed and young larvæ were obtainable together on September 10th, 1905, but as the earliest appearance of larvæ that year would be about August 12th, and the last of my larvæ to spin up did so on September 30th, it appears that there is a period of something like seven weeks during which it is possible to find the larvæ. This period would probably fall later in a cold and backward season (*vide* "Notes on *E. reticulata*," by the Rev. A. M. Moss, in Ent. Mo. Mag., May, 1897).

Description of Pupa. September 16th, 1905. — Average length 9 mm., or rather over eleven thirty-seconds of an inch. Some, probably females, were nearly 10 mm. in length. The pupa is remarkably stout, so that its general appearance is short and stumpy. The surface is smooth and glossy. Anterior portion, enclosing head, thorax, antennæ, legs, and wings, bright transparent green. Abdominal portion light golden brown, the incisions of the segments being darker brown. Green medio-dorsal line and, in some pupæ, traces of the red larval spots are visible at the segmental divisions. Between the eleventh and twelfth segments a dull red-brown spot (corresponding to the red larval blotch) is distinct in all the pupæ.

Perfect Insect. — The perfect insect appears to extend over a period of at least four weeks, and, judging from the behaviour of

a number of pupæ left in my care that year, 1905 (from larvæ collected by Mr. Moss in 1904) and from observation of the insect itself in its natural haunts, I should say that even where it does occur it will never be very plentiful at any one time. Those I had, emerged in a desultory fashion from July 1st to 30th, one or two each day, and never more than five on one day. Outside, on July 16th, Mr. Geo. Holmes and myself, after four hours' hard work, secured only nine specimens (four fresh, five worn). We missed five, but may possibly have captured some of these again later in the day, so that the insect was certainly not common on that day. But I have not the slightest doubt that, had we visited the localities from day to day, we might have taken fresh *reticulata* up to the first week in August. We were rewarded, however, for sparing the perfect insect in July by the discovery of the larvæ in fair number throughout August and September.

The flight of *E. reticulata* is quick and jerky, not of long duration, for they soon seek shelter among the leaves of the surrounding trees. The extremely rough nature of the ground, remarked upon by Mr. Moss in his former paper, makes their capture something of a feat. The rich colour of the fore wings is most distinct, even when the moth is flying, and notwithstanding the excitement which always accompanies the pursuit of a rare insect, it is impossible to mistake it for anything else.

I regret that I did not find it possible to photograph the larvæ *in situ*. The figures, however, show the general form of the larva and its usual resting postures during the daytime. Fig. 2 had to be coaxed into position for the camera, though, as stated before, the attitude depicted is a common and characteristic one of the *full-grown* larva in a state of nature.

ON THE GENERIC NAME *RHYACTONIA*, Hb.

By EDWARD MEYRICK, B.A., F.R.S., &c.

I SHOULD be sorry if Mr. South's commendation of the substitution of this name for *Retinia* should attract others into a deceptive morass. An inspection of the facts as recited by Prof. Fernald will show that the supposed fixation of types by Stephens is accidental only; I (and others) hold that his restrictions are not valid unless intentional. As the true *hastana* is not British, Stephens did not, by merely failing to mention it, exclude it from either of his two uses of the name. Further, by using the same name for a subgenus and genus within three pages, he evidently did not regard the first use as conflicting with the second, and therefore the first use was not intended to be generic, and therefore was not. Again, in the generic use, though he misapplied

a specific name, yet his intention was clearly to base the genus on Hübner's species, and not to introduce a different one.

Finally, the name *Rhyacionia* has sixty-two years' established use as based on the type *hastana*, which is after all in accordance with Hübner's specification, and Stephens' intention, as explained above. It might be deemed incredible that anyone would offer to cause so much confusion on such flimsy grounds. Even if the change were made, the discovery of a casual mention of *Rhyacionia hastana* in any publication of earlier date would suffice to reverse the whole procedure.

Thornhanger, Marlborough: Feb. 9th, 1912.

NEW SPECIES OF *BOARMIINÆ* FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

(Continued from p. 73.)

Alcis (?) *conjuncta*, sp. n.

♂. Fore wings whitish, suffused and clouded with ochreous and speckled with blackish; antemedial line blackish, diffuse; postmedial line blackish, dentate; discoidal spot black, placed on a blackish band from costa which connects the antemedial and postmedial lines on dorsal area; subterminal area blackish, interrupted by the ground colour at apex and at middle, and traversed by a paler wavy line. Hind wings ochreous, merging into whitish on the costal area, speckled with blackish; discoidal spot black, with traces of a transverse line just beyond; some large blackish freckles about middle of terminal area and at tornus. Fringes of all the wings ochreous, marked with blackish. Under side whitish markings faint.

♀. Similar to the male, but on the under side the markings are almost as distinct as on the upper side.

Expanse 28 millim.

Collection number, 1638.

One example of each sex from Arizan (7300 ft.), August, 1908.

Alcis (?) *virgata*, sp. n.

♂. Fore wings white, yellowish suffused and striated with black on outer area, dusted with blackish on basal area; antemedial line blackish, diffuse, indistinct; postmedial line black, only indicated by dots below costa, joined below cell by a black band from middle of costa; terminal area black, patch with yellowish at apex and about middle. Hind wings white striated with black; terminal area yellow tinged, black stræ thicker towards costa, some black dots on dorsum towards tornus. Under side rather paler than above, otherwise similar.

Expanse, 26 millim.

Collection number, 1644.

A male specimen from Kanshirei, July, 1908.

Alcis semiclarata nebulosa.

♀. Fore wings blackish brown clouded with black especially on the median third; antemedial line black, curved; postmedial line black, angled at veins five and two.

Expanse, 36 millim.

Two female specimens from Arizan (7500 ft.), August, 1908.

Alcis semiclarata divisa.

♂. Basal half of fore wings blackish limited by a black, angulated, diffuse line. Hind wings ochreous lightly sprinkled with blackish.

Expanse, 30 millim.

Collection number, 1675.

One male specimen from Arizan (7500 ft.), August, 1908.

Except that they are smaller in size, I cannot find that these specimens from Formosa are specifically separable from Indian *semiclarata*, Moore, and I therefore describe them as forms of that species.

Alcis macularia, sp. n.

♂. Fore wings ochreous, reddish tinged, striated and freckled with black, striae most distinct on the costa; antemedial line black, diffuse, curved, not very distinct; postmedial line represented by black marks on the costa, veins, and dorsum; subterminal line pale ochreous, wavy, shaded with blackish except on the costal area; discoidal mark black, linear, surrounded with blackish, a black spot above it on costa; fringes ochreous marked with brownish between the veins, preceded by black lunules. Hind wings ochreous faintly striated with blackish; discoidal spot black, small; fringes as on the fore wings but hardly marked with brownish. Under side ochreous faintly striated with blackish; terminal area of fore wings clouded with blackish.

Expanse, 36 millim.

Collection number, 807.

A male specimen from Arizan (7500 ft.), September 13th, 1907.

This species appears to be near *A. megaspilaria*, Swinhoe, from Sikhim.

Alcis basinotata, n. n.

Alcis nigronotata, Wileman, Entom. xlv. 71 (1912).

Ectropis (?) *rusticaria*, sp. n.

♂. Fore wings greyish brown, costal area striated with ochreous and blackish; antemedial line represented by black spots on costa, median nervure, and dorsum; postmedial line blackish, dotted with black, angled at vein six, incurved before dorsum; subterminal line pale, wavy, inwardly edged with blackish; discoidal mark black, black spots above and below it. Hind wings greyish brown; subterminal line pale, inwardly shaded with blackish. Fringes of all the wings pale brown. Under side grey freckled with darker, costa of fore

wings ochreous; terminal area of fore wings blackish, enclosing a grey quadrate spot below middle; all the wings with black discoidal spot and black dotted postmedial line.

♀. Rather paler, transverse lines less distinct.

Expanse, ♂ 40 millim., ♀ 42 millim.

Collection number, 808.

One example of each sex from Koannania; the male captured in March, 1908, and the female in April, 1906.

Ectropis pulveraria, sp. n.

♂. Fore wings grey brown, sprinkled with blackish; antemedial line black, curved; postmedial line black, elbowed below cell, incurved before dorsum; subterminal line whitish, irregularly serrated, inwardly clouded with black towards costa and dorsum; discoidal mark black, elongate. Hind wings rather browner, antemedial line blackish, indistinct; postmedial line black, curved and recurved; subterminal line pale, irregularly serrated, inwardly shaded with blackish; discoidal mark blackish, minute. Under side whitish brown, freckled with darker; subterminal area of fore wings blackish, except at apex; subterminal area of hind wings clouded with blackish; all the wings have a blackish discoidal spot.

♀. Similar to the male above; on the under side the outer third of all the wings is blackish, except towards termen of hind wings.

Expanse, 32 millim.

Collection number, 628 a.

A male specimen from Kanshirei (7300 ft.), April, 1908; a female from Koannania, May, 1907.

THREE NEW CULICIDÆ FROM THE TRANSVAAL.

By FRED V. THEOBALD, M.A., F.E.S., &c.

Pseudohowardina lineata, nov. sp.

♂ and ♀. Head deep brown, with a median white line and a thin white line around the eyes; proboscis deep brown, with a line of white scales on the basal half. Thorax deep brown, with three thin pale yellow lines, the median one forked around the bare space before the scutellum, a thin white line on each side; two broken white lines on the pleuræ and spots. Abdomen deep brown, with traces of apical white bands and apical spots. Legs deep brown, unbanded, femora with a white line beneath, and in certain lights the tibiæ pale below. Male palpi acuminate, no hair tufts, brown. Length, ♀ 3.5 to 4.5, ♂ 4 mm.

Habitat.—Onderstepoort, Transvaal.

Time of Capture.—August 8th and 11th, 1910.

Observations.—Described from three females and one male. A very marked species, easily identified by the thoracic ornamentation.

Types in the writer's collection.

Grabhamia caballa, nov. sp.

♀. Head and thorax with rich deep golden scales, a dark patch on each side of the head. Thorax showing traces of linear markings, and with golden chætæ. Palpi and proboscis deep brown: antennæ brown. Abdomen deep brown, with basal creamy bands which spread out to form large lateral spots, and also send out median processes which in some specimens form a dorsal line. Legs brown, mottled with creamy scales, and with prominent basal pale bands; ungues all equal and uniserrate. Wings with brown and creamy scales. Length 4 to 5 mm.

Habitat.—Onderstepoort, Transvaal.

Time of Capture.—November, December, and January.

Observations.—Described from twelve females. It comes near *G. durbanensis*, Theob., but can be told by the hind ungues being uniserrate.

Type in the writer's collection.

Uranotania nivicous, nov. sp.

♀. Head deep brown, with golden forked scales; palpi and proboscis deep brown. Thorax rich brown, with long dark chætæ; pleuræ pale ochreous; scutellum dusky brown, with dark border bristles. Abdomen black, with apical creamy median areas; venter pale creamy white. Legs deep brown, pale at the base, last two hind tarsi and most of the third creamy white; the last tarsals of the other legs show pale reflections. Wings with normal venation, but in certain lights subcostal, second, and fourth veins show brilliant violet reflections under the microscope. Length 4 mm.

Habitat.—Onderstepoort, Transvaal.

Observations.—Described from a single perfect female sent me by Dr. Theiler. It comes nearest *Uranotania apicoteniata*, Theob., but can at once be told by the dark scaled head and the absence of pale apical bands on the first, second, and third hind tarsals, and on the second tarsals of the fore and mid legs.

Type in the writer's collection.

Wye Court, Wye: January 3rd, 1912.

NEMOURA DUBITANS (MORTON) AS A BRITISH SPECIES.

By LIEUT.-COLONEL C. G. NURSE.

ALTHOUGH I devote myself, in my entomological studies, chiefly to Lepidoptera and Hymenoptera, I have been for some years in the habit of taking such specimens of Neuroptera as I may come across casually. Last year I sent a number of specimens of the latter order to Mr. K. J. Morton for determination, and among them he found a single example of *Nemoura dubitans*, which species had not previously been recorded from Britain.

The capture of the above specimen was recorded by Mr. Morton in the 'Entomologist' for 1911 (vol. xlv. p. 184). My knowledge of the Neuroptera is of the slightest, but I determined to make an effort to obtain more specimens of this species, and knowing from the label on the first the exact date and place where it should be looked for, I visited the locality on April 12th, 1911. The place in question, which is about a mile from the village of West Stow, is an ideal collecting ground, and I have taken there several more or less local or rare species of other orders. A marshy spot, covered with reeds and rushes, and studded with trees and bushes of various kinds, it runs down to the river Lark, here only a few yards broad, and the whole place looks as if it had never been cultivated. Walking slowly along the bank of the stream, I soon detected a *Nemoura* struggling along, half swimming and half flying, on the surface of the water. With the help of a long reed I captured and boxed him, and during the course of the morning I obtained a couple of dozen or so, most of them in a similar way. They were probably just emerging.

A few days later I again visited the locality, and on this occasion I found *Nemouras* in large numbers. A few were flying, but most of the specimens were sitting on branches of alders and the stems of some large beeches, where they were easily detected. I took as many as I required, in fact, had I been so inclined, I could have taken scores. Nearly all, on examination by Mr. Morton, proved to be *N. dubitans*, a few only being *N. inconspicua*.

During the remainder of the summer I took every *Nemoura* that I came across in other localities in the neighbourhood, with a view to ascertaining the distribution of *N. dubitans* in West Suffolk. However, all those taken elsewhere proved to be either *N. inconspicua* or *N. variegata*; it seems, therefore, probable that *dubitans* is very local, though it is almost certain to occur in other places along the river Lark.

I have to thank Mr. Morton for his help in determination, which is not at all easy unless one has made a special study of the smaller Neuroptera.

ON TWO PECULIAR FORMS OF *BOARMIA* *REPANDATA*.

By WILLIAM MANSBRIDGE, F.E.S.

Nigro-pallida, var. nov.

For several years prior to 1909 I had captured odd specimens of a peculiar pearly grey form of *B. repandata* of the *nigra* variety. These specimens being all more or less worn were regarded as weather-bleached insects and were not thought of much interest.

In June, 1909, however, I bred about one hundred moths from a captured wild female, and a good proportion—twenty-five per cent.—of these had larger or smaller median areas of pearly grey scales on both fore and hind wings. In extreme examples the grey area occupies the whole of the central part of the wings, and in others only a small part of the alar surface. All the insects are symmetrical, and where the subterminal lines cross the pale blotches they are somewhat lighter in colour and can be clearly seen. The remainder of the wings, except the scapulars, which are dull ochreous, are of a deep velvety black.

The remaining part of the brood were var. *nigra* of an unusually intense black, varying in the development of the subterminal lines, from specimens in which these are brilliant and complete to examples in which they are almost absent, giving, as an extreme, an almost entirely black moth.

Under the microscope the grey areas are seen to be fully scaled, not, as one finds to be the case with the transparent forms of *Odontopera bidentata* var. *nigra*, thinly scaled or with the scales absent. The appearance of the insect is more suggestive of the xanthism found in so-called bleached *Epinephele ianira*, and the varying size and amount of the pale area further point to a case of parallelism.

The peculiarity of these forms is not due to injury, as I have examples showing undoubted injury which has resulted in a clear, white, local patch which is not repeated on the other wings, and, therefore, is not symmetrical.

These xanthic varieties, if I may so call them, are fully up to the average in size and development, in some cases above it, and the true *nigra* forms, when very much dwarfed through the race running out, do not show the peculiarity referred to in a single instance.

Cross pairings were obtained from black specimens of the 1909 brood, with the result that from a larger number of imagines in June, 1910, only a few—some half dozen in all—of the xanthic form were produced.

It may be concluded, therefore, that as this variety is permanent and recurrent and found in a wild state, it is worthy a varietal name, and I propose that of *nigro-pallida* to distinguish it. The types, male and female, are in my collection. This variety must not be confounded with the melanic white blotched form, taken rarely in North Wales and Yorkshire, which has large pale markings in the subterminal region on the fore wings only, as normally occurs in typical specimens, and in which there is a general pale irroration more or less pronounced.

Ochro-nigra, var. nov.

In July, 1910, I made various experimental crossings with the object of discovering the possible parentage of var. *nigro-*

pallida, but without success. As the result, however, of pairing a Knowsley type with var. *nigra* from the same locality, I obtained a form with the terminal and subterminal lines very distinct, of a deep glossy black ground without irroration, but having the usual pale patches on the subterminal line of the fore wings of a clear ochreous colour instead of white; otherwise as in var. *nigra*.

This variety is a very striking and beautiful insect, and I propose to distinguish it by the name—*ochro-nigra*. The original parents were from Knowsley, Lancashire, and the types are in my collection.

4, Norwich Road, Wavertree, Liverpool.

BUTTERFLIES AT DIGNE.

By GERARD H. GURNEY, F.E.S.

THE following list of butterflies comprises all those species which I took during July and the first few days of August last summer at Digne, with a few notes on the more interesting species. In spite of the abnormally hot summer it was not an early season, neither were insects so plentiful as might have been expected. Certain well-known places and localities which previously I had found teeming with butterfly-life were, for some unaccountable reason, often productive of only the commonest and fewest species; for instance, the well-known gorge beyond the Baths was on many days a great disappointment; however, certain rare and interesting things were taken, and I was specially glad to obtain a nice series of the somewhat elusive *Erebia scipio*. I was struck by the extremely small size of many of the different forms; this may have been due to the want of rain and to the drought. Towards the end of July vegetation generally began to be much burnt up, though constant rain showers in the mountains kept the streams and rivers from becoming dry, and in the orchards and gardens adjoining the Eaux Chaudes the second crops of hay and clover were luxuriant. The heat was excessive all the time, and the thunderstorms and short deluges of rain which came on frequently in the evenings did not last long enough to cool the air. The inhabitants all told me it was an exceptionally hot summer. I was at Digne from July 19th until August 2nd.

Erynnis lavateræ. Somewhat scarce; the few specimens taken were fresh but very small.—*E. alceæ*.—*Hesperia carlinæ* var. *cirsii*. Common.—*H. carthami*.—*Pyrgus sœo*.—*Nisoniades tages*.—*Argiades sylvanus*. Very abundant and fine.—*Thymelicus actæon*.—*Adopœa flava*.—*A. lineola*.

Heodes virgaureæ. Males were locally frequent after July 25th;

females scarce.—*Loweia alciphron* var. *gordius*. Much worn.—*L. dorilis*. Males very common and fresh.—*Rumiccia phleas*.

Lycæna arion. Only two or three worn ones noted.—*Cupido osiris* (*sebrus*). I did not note this species; it was common at Digne when I was last there in June, 1907.—*Cyaniris semiargus*.—*Polyommatus damon*. Generally common, especially round Villars, all of them much smaller than specimens from the Rhone Valley.—*P. admetus* var. *rippartii*. Generally distributed; in a few places abundant; quite fresh on July 20th. A long series shows much variation in the size of the spots under side of the hind wings. In several of my specimens the lower line of spots is reduced to the merest dots; in one there are only three very minute specks, in another the two lowest spots are joined together.—*P. meleager*. Males were quite common and very fine; the beautifully coloured females, all of the type, were rather scarce.—*P. hylas*.—*P. escheri*. Not very common.—*P. icarus*. Varying enormously in size, many being mere pygmies; the females generally were very blue.—*Agriades thetis*.—*A. corydon*.—*Aricia medon*.—*Plebeius argus* (*egon*). I do not think I noted this species.—*P. argyrognomon*. Quite fresh and rather common.—*Erebes argiades*. Rare; the few I caught were all of the type; when at Digne in June, 1907, *E. coretus* was common.—*Celastrina argiolus*. Fine fresh specimens of the second brood were frequently noted flying round the tops of willow trees.—*Lampides telicampus*. I caught a perfectly fresh female in a field of lucerne on July 28th; it is rare at Digne.

Zephyrus quercus. Common near the Baths, sitting on the leaves of the cherry trees, very large, fine specimens, and quite fresh.

Strymon spini.—*S. acacis*. A few rather worn ones near Villars on July 28th.—*S. ilicis*. Type and var. *cerri*.

Iphiclides podalirius. Very common, larvae were noted on sloe, almond, and apricot trees.

Papilio alexanor. Frequently seen, but in rags on July 20th; very small larvae were common, and females were seen depositing ova on the medium-sized plants of *Sesili montanum*, but never on one which was already occupied, no two larvae ever being seen on two plants anywhere near each other. I have seen it stated that the larvae of *P. alexanor* cannot be reared on ordinary garden carrot. I found, however, that the few larvae I brought home fed up freely on this food, and turned into large full-sized pupæ.—*P. machaon*.

Parnassius apollo. Very common and quite fresh, half-way up the Dourbs on July 28th.—*Aporia crataegi*.—*Iuris brassicae*.—*P. rapæ*.—*P. manni*. I brought home a large number of unset *P. rapæ*, amongst which I shall probably find *P. manni*.—*P. napi*.—*Pontia daplidice*. Not common.—*Leptosia sinapis*.—*L. duponcheli*. The remains of the first brood were still lingering, but no signs of a second brood.—*Colias hyale*.—*C. edusa*.—*Gonepteryx rhamni*.—*G. cleopatra*.

Dryas paphia. Common.—*Argynnis aglaja*.—*A. adippe*. Type and var. *cleodora* both equally common.—*Issoria lathonia*.—*Brenthis daphne*. Much worn.—*B. dia*. A few freshly emerged specimens were taken.

(To be continued.)

BY THE WAY.

BEQUEST TO THE NATIONAL TRUST.—Mr. George Henry Verrall, of Sussex Lodge, Exning, Newmarket, formerly Conservative M.P. for East Cambridgeshire, one of the leading racing officials, and a partner in the firm of Messrs. Pratt and Co., a former President of the Royal Entomological Society, who died on September 16th, aged sixty-three, left estate of the gross value of £58,268, of which the net personalty has been sworn at £40,778. He left his collection of British Diptera and the cabinets in which it is contained to his nephew, James Edward Collin, conditional upon his offering to the Natural History Museum, South Kensington, three pairs of each species of which he possessed a full series (six pairs constitute a full series), and at least one pair of each species of which he possessed more than one pair; and all his real and personal estate in the parish of Wicken, Cambs., to the National Trust for Places of Historic Interest or Natural Beauty.—‘The Times,’ February 14th, 1912.

The second meeting of the General Malaria Committee, held in Bombay last November, gives one a capital idea of the vigorous steps being taken by the Indian Government to combat the mosquito scourge. The presidential address of Sir C. P. Lukis, the Director General and Acting Sanitary Commissioner, among a mass of practical information (ably summarized in the ‘British Medical Journal’ of January 6th last), expresses the hope that, with the aid of the new Indian Research fund, malariometric investigations would now be possible, and the bionomics of *Anopheles* further elucidated. It refers to Dr. Bentley’s report on the recent malarial outbreak in Bombay, which confirms earlier observations upon *Neocellia stephensi* as the local culprit. It recounts Major Christopher’s discovery that another gnat, *A. ludlowi*, causes havoc in the Andaman Islands, but only within half-a-mile of the coast, no case of malaria at all being found inland, since this species breeds only in salt and brackish swamps. *A. ludlowi* is hardly to be distinguished from *A. rossi*, “yet the existence of two distinct species is the explanation why the proximity of rice lands and swamps is innocuous, provided that these are at a distance from the sea.” A bright season is anticipated, owing to the deficient rainfall of the last year; no epidemic of malaria is imminent, and the investigators should now have ample leisure to prepare for a future campaign.

That Mecca of general Nature lovers, the thriving Selborne Society, held its annual *Conversazione* on February 16th last, in the rooms of the Civil Service Commission, with Lord Montagu of Beaulieu, one of the Vice-Presidents, in the chair. A good

many entomologists were present, and the exhibits were keenly appreciated. Microscopists were well provided for, since a number of unusually interesting slides were on view. The display of Old English Folk Dances was a step in the right direction, and the exhibition of the hundred editions to which Gilbert White's 'Natural History' has now run, together with that of the original MS., afforded much pleasure to the very numerous members and guests assembled.

Would that the Rev. T. A. Marshall or Mr. Joe Dunning were yet amongst us to do an essay upon the work recently published by the American Ent. Soc., of which Mr. Meyrick has given us so lucid and masterly an account in a current contemporary! If a Society's scientific status is gauged by the quality of its Transactions, vol. xxxiii. of that quoted will stand as an inerasible blot and detract very seriously from its prestige. We do not know Mr. Kearfott; but he has stirred up more animation in this country than we have seen displayed for a long time. The greatest motive power among us is still discussion upon priority; the word is instinct with electricity in every study and museum. "The earliest name shall stand," cries one. "Let us at least have common sense, of which science is the essence," protests a second. "*Eucosma kokana, lolana, nomana, nonana*," another quotes, and so *ad nauseam*.

C. M.

NOTES AND OBSERVATIONS.

LABIDURA RIPARIA.—In "By the Way" (*antea*, p. 76) we are told that all the Christchurch records of *Labidura riparia* come from the base of Hengistbury Head. Whether the records do or not I cannot say, but I think it is doubtful if the earwig itself did. In the two haunts (possibly out of a larger number) near Bournemouth its habits suggest that the soil of the "bluff" is unsuitable for it, and I have never been able to find a specimen there, although it is easy enough to find them in the other two spots. I invariably get them on a certain kind of sandy cliff, of which there seems to be none similar at Hengistbury. It appears to me more likely that "Christchurch" referred to any part of that coast, while it was the chief town in the district, Bournemouth being non-existent, or practically so.—W. J. LUCAS.

NEW BRITISH PROCTOTRYPIDÆ.—It seems advisable to publish the following list of new Proctotrypidæ which I have taken in Britain at various times, and have given to Dr. Kieffer:—*Paragryon algicola*, Kief., n. s., Boll. Lab. Zool. Portici. iv. (1910) p. 343. Males and females taken under seaweed at Fishbourne, Isle of Wight, in company with *Actinopteryx fucicola*, *Actidium coarctatum*, and other Coleoptera.—*Loxotropa pedisequa*, Kief., n. s. "Angleterre (H. Donis-

thorpe).” André, x. (1911) p. 925.—*Paramesius spinosus*, Kief., v. *atriventris*, Kief., n. v. “Angleterre (H. Donisthorpe).” André, x. (1911) p. 753.—*Spilomicrus hemipterus*, Marsh., v. *pedissequus*, Kief., n. v. “Angleterre (H. Donisthorpe).” André, x. (1911), p. 774.—*Spilomicrus basalyformis*, Marsh., v. *pilosus*, Kief., n. v. “Angleterre (H. Donisthorpe).” André, x. (1911) p. 791.—*Galesus filicornis*, Kief., v. *obscuripes*, Kief., n. v. “Angleterre: Oxford en automne (H. Donisthorpe).” André, x. (1911) p. 857.—HORACE DONISTHORPE.

HERR SPRÖNGERTS has kindly sent me the following list of Heterocera taken by himself (in addition to the species enumerated by me in ‘Entomologist,’ xlv. p. 69) at Abisko in Swedish Lapland:—*Agrotis speciosa* var. *arctica*, *A. primule* var. *conflua*, *Anarta staudingeri*, *Herminia tentacularia* var. *modestalis*, *Lygris populata*, *Larentia fluctuata* var. *incanata*, *L. incursata*, *L. montanatu* var. *lapponica*, *L. ferrugata* var. *spadicearia*, *L. polata*, *L. hastata* var. *subhastata* and var. *mæstata*, *L. affinitata* var. *turbaria*, *L. minorata*, *Gnophos sordaria*, *Psodos coracina*, *Pygmaena fusca*, *Fidonia carbonaria* var. *roscidaria*, and *Phragmatobia fuliginosa* var. *borealis*.”—W. G. SHELDON; February 10th, 1912.

ACHERONTIA ATROPOS AND SPHINX CONVULVULI IN LANCASHIRE, 1911.—I wish to record the occurrence of a specimen each of *A. atropos* and *S. convulvuli* at St. Anne’s last autumn. Both specimens were reared, by a young collector, from larvæ found in a garden.—J. M. MUIRHEAD; Norwood, Headroom (Gate Road, St. Anne’s-on-Sea).

EARLY APPEARANCES OF LEPIDOPTERA.—On January 15th a female *Selenia lunaria* emerged from a pupa which had been kept with others in my dressing-room where there had been no fire. This afternoon (February 15th) one of my colleagues, the Rev. E. A. Hopkins, took a specimen of *Tephrosia bistortata*.—(Rev.) J. E. TARBAT; Fareham.

PHRYXUS LIVORNICA IN DEVON.—I had the good fortune to have brought to me a living male specimen of *Phryxus (Deilephila) livornica* on January 19th; it was caught on a shrub in a garden. As I can find no record of the capture of this rare insect at this time of the year, I thought it would be well to record it.—G. J. ENOCK; Tavistock, February 15th, 1912.

PHIGALIA PEDARIA IN DECEMBER.—I see in the ‘Entomologist’ (*antea*, p. 80) that *P. pedaria* was out in the Reading district on January 7th. I thought it would be interesting to record that I took a perfect specimen on an arc lamp outside Messrs. John Barnes’s premises in the Finchley Road, N.W., on December 30th, 1911, about 7 p.m.—L. E. DUNSTER; 44, St. John’s Wood Terrace, N.W., February 20th, 1912.

NOTE ON VANESSA IO.—On February 7th a friend brought me three live females of *Vanessa io* taken in his house at Greenhithe. Altogether nearly a dozen have been taken by him in the house during the last four weeks. On further inquiry, he tells me that

they were all captured in a room facing north, occurring on any fine day, some even during the few extreme cold days, and as he has two old sheds in the garden, possibly they may have been hibernating there. I might further mention as to their remarkable vitality that on transferring the three he gave me from one box to another one of the specimens escaped so quickly that I was unable to recapture it. It struck me that one does not often hear of *V. io* so plentifully in January.—STANLEY A. BLENKARN; Norham, Cromwell Road, Bockenham, February 11th, 1912.

GLoucestershire LEPIDOPTERA.—I am now able to add the following to our local list:—*Plusia moneta*, taken at flowers of honeysuckle on July 9th, 1909, near this city, and at light in Gloucester on July 12th, 1909, by the Rev. G. M. Smith, who also found the larvæ here on *Delphinium* in the following season, on June 1st, 1910; *Lobesia permixtana* (*reliquana*), taken in the Forest of Dean on June 15th, 1911; *Hemimene* (*Dichrorampha*) *tanacetii* (*herbosana*), taken on our hills flying low amongst mixed herbage between 4 and 6 p.m. on August 31st, 1911, *Lithocolletis sorbi*, bred on July 7th, 1911, from mined leaves of *Pyrus aucuparia* collected in the forest on June 29th preceding; and *Nepticula fulgens*, taken on the wing amongst beech on our hills at 2 p.m. on May 11th, 1911.—Mr. Meyrick kindly identified the Micros for me.—C. GRANVILLE CLUTTERBUCK; Heathside, Heathville Road, Gloucester, February 4th, 1912.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, December 6th, 1911.—The Rev. F. D. Morice, M.A., President, in the chair.—The following gentlemen were elected Fellows of the Society:—Dr. Beckwith Whitehouse, 52, Newhall Street, Birmingham; Messrs. F. W. Edwards, Kingswear, Cornwall Road, Harrow; Douglas Pearson, Chilwell House, Chilwell, Notts; B. H. Smith, B.A., Edgehill, Warlingham, Surrey; C. F. M. Swynnerton, Mount Chirinda, Melsetter, South Rhodesia.—Mr. C. J. Gahan exhibited an insect recently brought to the British Museum, and recognized by him as belonging to *Prisopus*, a remarkable and specially interesting genus of Phasmidæ. The species of *Prisopus* inhabit Tropical America, and appear to be very rare. The one now exhibited was new, and he proposed to name it *Prisopus fisheri*, in honour of its discoverer.—Mr. South, a drawer of *Leucania pallens* and *L. favicolor*, captured and reared by the Rev. W. P. Waller in the Woodbridge district of Suffolk. He observed that, seeing that Mr. Waller had reared *favicolor* from eggs laid by a *pallens*-like female, and obtained *pallens* from the ova of a female *favicolor*, the obvious inference was that there was cross-pairing in each case. Mr. South added that he understood that *favicolor* cannot be separated from *pallens* by any difference in the genitalia, and was informed that cross-pairings of *pallens* and *favicolor* are not uncommon in the habitat of the

latter. He was, therefore, inclined to suppose that *favicolor* is a salt-marsh development of *pallens*.—Mr. Donisthorpe, a specimen of *Eryx fairmairei*, Reiche, a species of Coleoptera new to Britain, taken by him in Sherwood Forest, on July 11th, 1908. He also showed a French specimen of the same species, and examples of *Eryx atra*, F., the other known British species, for comparison.—Mr. W. G. Sheldon, a collection of Rhopalocera made by him in Jemtland and Swedish Lapland, in June and July, 1911.—Mr. Henry J. Turner, a large number of specimens of *Luperina nickerli*, of which the British form or race has been hitherto known as *Luperina gueneei*, together with series of other races from the Continent. Mr. Turner also exhibited a long series of *Erebia aethiops* from many Continental localities and also from Aviemore, Scotland. He made the exhibit at the suggestion of Dr. Chapman, with reference to an article in the Bull. Soc. Ent. France, No. 51, 1911, by M. Roger Verity, in which the Scotch (Galashiels) race of this species was named var. *caledonia*.—Prof. Poulton, a series of specimens tending to refute the view, again recently advanced, that changes of colour and pattern in allied forms are due to climate, and especially to moisture. Also a set of the mimetic *Pseudacraeas* and their models, collected by Mr. C. A. Wiggins, in the neighbourhood of Entebbe, which contrasted remarkably with a set of seventeen *Pseudacraeas* collected by Dr. G. D. H. Carpenter on Damba Island, on the equator, in the Victoria Nyanza, about twenty miles south-east of Entebbe. Also four males and one female of *Planema alcinoe*, captured August 10th, 1911, in the forest, one mile east of Omi, near Lagos, by Mr. W. A. Lamborn, "in a confused mass." Prof. Poulton also exhibited the cocoon of *Norasuma kolga*, together with the moth which had emerged from it. The compact cocoon itself was reddish, with an outer imperfect covering of yellow silk. In some cocoons, including the one exhibited, the silk of this loose and open network formed dense little masses here and there which, being bright yellow in colour, much resembled the cocoons of Braconid parasites. He said that he had been shown by Mr. J. H. Durrant similar spherical bodies scattered over the cocoon of the Tineid moth, *Marmara salictella*. He also exhibited five specimens of *Anauris psyttalea*, Plötz, being all that Mr. W. A. Lamborn "obtained from twenty-five pupæ, the rest being parasitized by Tachinidæ." Seventeen dead pupæ from the same company, twelve of the Tachinid flies, and a number of their puparia were also exhibited. He also exhibited specimens and gave an account of observations sent by Mr. Lamborn, which threw further light on the letter written January, 1891, by the Rev. A. C. Good, Ph.D., from West Africa, from which Dr. W. J. Holland had inferred that the larvæ of *S. lemolea* are aphidivorous; extracts from Mr. Lamborn's letters, together with an investigation of his material, indicate that their food consists of Coccidæ.—Mr. W. J. Kaye, a drawer full of Syntomidæ that had been collected by himself in South Brazil, in the early part of 1910. The following papers were read:—"On the *Nictitans* Group of the Genus *Hydræcia*, Gn.," by the Rev. C. R. N. Burrows. "On the Dates of the Publications of the Entomological Society," by the Rev. G. Wheeler, M.A., F.Z.S.—GEORGE WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*December 14th, 1911.*—Mr. W. J. Kaye, F.E.S., President, in the chair.—*Special Meeting.*—It was agreed unanimously at an unusually large meeting to increase the annual subscription to ten shillings and the life subscription to six guineas.—*Ordinary Meeting.*—Mr. R. G. Todd, of Barnet, Mr. G. E. H. Poskett, of Ilford, Mr. Mr. A. Quarrington, of Norwood, and Mr. E. A. Stowell, B.A., of Kingston, were elected members.—There was a special exhibition of *Rumicia phleas* and its allies. Mr. Tonge, series from the south-east counties, and bred Continental specimens; Mr. Newman, on behalf of Mr. Quarrington, ab. *schmidtii* and striated forms; the Rev. G. Wheeler, series from England, S. France, and S. Switzerland, including suffused examples, ab. *cæruleopunctata*, ab. *bipunctata*, ab. *unipunctata*, &c.; Mr. R. Adkin, representative series from Eastbourne this year, and analysed the variation occurring there; Mr. A. E. Gibbs, series from England, North-east France, East Pyrenees, Corsica, Algeria, Turkistan, and Japan, together with many closely allied species from the Palaearctic and Nearctic regions; Mr. Turner, series including ab. *alba* from Brasted; Mr. R. South, a selection illustrating the ordinary variation, including ab. *schmidtii*, and pointed out how the variation of the American representative *hypophleas* had almost parallel variation; Mr. Cowham, ab. *schmidtii* from Oxshott; Mr. Frohawk, a long bred series of *C. dispar* var. *rutilus* from Continental ova; Mr. C. P. Pickett, long and varied series of four broods in 1911, and many aberrations taken during the past ten years; Mr. Edwards, closely allied Central and East Asian forms; Mr. Kaye, bred specimens. In the subsequent remarks it was noted that the species had appeared in great abundance even in gardens and streets, that there were extremely few striking aberrations, that the later broods were generally darker, that the larvæ hibernated in any instar, and that the species was by no means common in Switzerland.—Mr. West (Greenwich) exhibited a drawer of the Society's cabinet in which he had arranged the British Hymenoptera recently presented to the Society.—Mr. Ashdown, a collection of Lepidoptera taken by him in Switzerland and near Chamonix in June and July last.—Mr. Newman, a number of well-marked aberrations from the collection of Mr. Hills, of Folkestone.—Mr. Quarrington, a fine blue female of *Polyommatus icarus*.—Mr. Buckstone, a series of variations of *Ematurga atomaria*.—Mr. South, a long series of three generations of *Acidalia virgularia* reared in 1911, from a female taken at Bishop Auckland in 1910.—Mr. Joy, two autumn bred specimens of *Apatura iris*, the rest of the brood going over as larvæ as usual.—Mr. Blonkarn, light and dark examples of *Lithosia deplana*, and a specimen of the cockroach *Periplaneta australasiae* taken from a case of oranges from Jamaica.—Mr. Edwards, the remarkably sexually dimorphic species *Euripus halitherses*, of which the female mimics a *Euplœa*.—Mr. Pickett, a very richly marked aberration of *Hipparchia semele*.

January 11th, 1912.—Mr. A. Sich, F.S.E., Vice-President, in the chair.—Mr. C. G. Gahan, M.A., F.E.S., of the British Museum (Natural History), and Mr. N. S. Sennett, F.E.S., of South Kensington,

were elected members.—Mr. A. W. Buckstone exhibited series of *Hybernia defoliaria* from several localities, and stated that variation had considerably increased in the last thirty years, and that around London the type form was much less frequent.—Mr. H. Moore, a huge tree-cricket, *Eumegalonotus blanchardi*, from Borneo, whose tegmina resemble leaves.—Mr. R. Adkin gave additional notes on the "Lepidoptera of a London Garden," exhibiting *Plusia moneta*, *Monopis rusticella*, *Gracilaria syringella*, *Argyresthia gædartaella*, and *Gelechia malvella*.—Mr. A. E. Gibbs, an aberration of *Pyrameis atalanta* bred from Vizzavona, Corsica, in which the diagonal red bands of the fore wings, and the marginal band of the hind wings are more or less pink, and some areas very much paler than usual.—Mr. Blenkarn, five specimens of *Anthrocera trifolii* var. *confluens* from Withycombe and Horsley, and various species of Coleoptera, including *Bledius secerdentulus*, recently announced as new to Britain by Dr. Joy.—Mr. H. Main, larvæ of the glow-worm reared from eggs, and also a larva of *Ocypus olens*.—The Reports of the Society's Field Meetings during the past year were communicated by Messrs. Edwards, Gibbs, Kaye, Priske, Tongo, and Turner.—HY. J. TURNER, *Hon. Report. Sec.*

THE CITY OF LONDON ENTOMOLOGICAL SOCIETY.—December 19th, 1911.—Rev. C. R. N. Burrows exhibited *Manduca atropos*, female taken at Mucking, Essex, June 9th, 1911, with some of the unlaid ova of which he had abstracted two hundred and eighteen—only one ovum was laid and this was reared.—Mr. H. B. Williams exhibited *Euchloë cardamines*, a male specimen, from Abridge, Essex, with the black apical blotch continued as a narrow line along the outer margin.—Messrs. V. E. Shaw, J. Douglas, and B. S. Williams exhibited their series of *Anchocelis pistacina* arranged to show its great variation; the vars. were *serina*, *obsoleta*, *ferrea*, *lincola*, *rubetra*, *brunnea*, *unicolor-brunnea*, *venosa*, *pallida*, *canaria*, and *sphaerulatina*, the latter being much commoner than the type and *canaria* the rarest; the specimens shown being from Finchley, Bexley, Epping Forest, New Forest, and Hunstanton.—Mr. B. S. Williams, *Agrotis nigricans*, var. *marshallana* from Wicken, July, 1911.—Mr. H. M. Edelsten, pupæ and cocoons of *Tapinostola hellmanni* and *T. concolor*, and photographs of anal appendages of females of these species to illustrate the notes read thereon.

January 2nd, 1912. — Messrs. James Douglas and F. H. Southgate were elected members of the Society.—The evening was devoted to the exhibition and discussion of *Rumiccia phleas*.—Mr. A. J. Willsdon, specimens from Deal, September, 1911, including two ab. *obsoleta*, and ab. *cæruleopunctata*.—Mr. W. E. King, ab. *alba*, ab. *schmidtii*, ab. *obliterata*, ab. *infra-extendens*, and an aberration combining abs. *obsoleta*, *cæruleopunctata*, and *magnipunctata*, all from Chingford district where he had noticed a partial fifth brood last season and found some numbers of the larvæ in October. Mr. H. B. Williams, some one hundred and seventy-one specimens from Missenden and district, including abs. *alba*, *eleus*, *addenda*, *caudata*, *suffusa*, *cæruleopunctata*, *parvipuncta*, *magnipuncta*, *basilipuncta*, *major*, *radiata*, *infra-extendens*. He stated that in comparing results of the

record 1911 season with other years, he was struck with the numbers of tailed and suffused forms which he attributed to the heat—of one hundred and twenty-three specimens taken in 1911, twenty-four had pronounced tails, and most of those captured in August showed a trace of tails, the September specimens being less remarkable. As to suffusion, only one specimen slightly suffused from September captures, and twenty-three among the August, of which twenty are *ab. initia*.—Mr. A. W. Mera, twenty-four specimens taken at Three Bridges, Sussex, early in August, all of a somewhat dull colour approaching *ab. initia*.—Mr. V. E. Shaw, *ab. obsoleta*, from Darenth, *ab. radiata*, Finchley, *ab. eleus*, *suffusa*, and *cæruleopunctata*, from Bexley. —Mr. C. Nicholson, three larvæ reared from ova of an *ab. cæruleopunctata*, and mentioned how easily females were induced to oviposit, in confinement, by placing them in a large glass cylinder over growing food-plant, covering top with mosquito netting. The showy stonecrop *Sedum spectabile* he had found very attractive to *R. phlæas*, he noticing on one occasion nine specimens on one plant in his garden at Hale End.

January 16th, 1912.—Mr. A. L. Mera was elected a member of the Society.—Annual "Pocket-box" exhibition.—Mr. L. B. Prout, specimens of a dark race of *Eubolia bipunctaria* from north Devon, taken on a dark soil and approaching the Continental var. *gachtaria*, Frr., also a female from Sandown, Isle of Wight, with the bands edging the central area strongly darkened. Mr. G. H. Heath, a specimen of *Anosia erippus*, var. *archippus*, found dead in the grass at Sandown, Isle of Wight, on the night of September 13th, 1908; *Xylomiges conspiciellaris* var. *melaleuca*, bred from a pupa dug in Worcestershire, September, 1897; *Acidalia incanaria* var. *bischoffaria*, taken at Brockley, September, 23rd, 1911, the first recorded specimen of this melanic form taken in this country.—Mr. Charles H. Williams, *A. grossulariata*, abs., including *varleyata*, *nigrosparsata*, and *lacticolor*.—Mr. V. E. Shaw drew attention to the fact that this latter aberration should be known as *ab. deleta*, it having been named so by Mr. Cockerell in 1889 (see 'Entomologist,' vol. xxii, p. 99). This is the first *ab.* figured in Edward Newman's 'British Moths,' p. 99.—Mr. A. J. Willsdon, a fine series of *Tapinostola bondii* collected at Folkestone in the grass and in fine condition, equal to bred specimens; *Melitæa aurinia* from Ireland—two specimens of a brick-red ground colour, the usual straw-coloured area being absent on the upper sides, and on under sides the usual pale spots also absent.—Dr. J. S. Sequeira, living stick insects, also *Vanessa antiopa* taken in 1803, from Donovan's collection.—Mr. James Douglas, *Nola cucullatella*, bred from Chingford, some showing a tendency to melanism.—Mr. T. H. L. Grosvenor, *Pieris napi* from first brood, showing following variation: (1) Male with female marking; (2) gynandromorph; (3) male with entire absence of black markings; (4) neural markings at base forming a green margin to secondaries; (5) female with failure of black pigment, and a female specimen from second brood with black discal spot in secondaries. *P. rapæ*, a male absolutely white, female of yellow coloration, female with black spots connected with black markings, and two females with black spots only just discernible; *Argynnis euphrosyne*, a black banded female, a female under side with pearl spots much enlarged, a male with

pearl spots greatly reduced.—Mr. A. W. Mera, *Spilosoma lubricipeda* ab. *radiata* and intermediate forms from Yorkshire, specimens of type and var. *radiata* from larvæ collected on Lincolnshire coast, and specimens from London district taken over a number of years, some but lightly marked, others approaching var. *fasciata*.—Mr. F. H. Stallman, *Dicranura bifida* taken at light, Beulah Hill, S.E., July 4th, 1911; *Colias hyale*, female, Margate, August 10th, 1911; *Cyaniris argiolus*, a male specimen having a row of well-marked spots on the under side margins of all four wings, from Holmwood; *S. convolvuli* found at rest near North Foreland lighthouse, August 23rd, 1911.—Mr. W. Crocker, a variable series of *Leucania fuscicollis* from North Kent marshes, also a pair of dwarf *L. fuscicollis* he had reared from ova in October, 1909, the remaining larvæ dying after hibernation; *Anthrocerus filipendule*, specimens with a dark vein intersecting the upper median and sixth spots, and fairly broad borders to hind wings, also two yellow aberrations, and a specimen having an under wing on left side in place of usual upper wing, the right side being normal, bred July, 1910.—Mr. V. E. Shaw, pupæ of *Pupitheca extensaria* from larvæ found on Norfolk coast; a series of *Emmelesia albulata*, and its var. *thules* bred from Unst pupæ, 1911, more than half the pupæ going over another winter.—V. E. SHAW, *Hon. Rep. Secretary*.

RECENT LITERATURE.

The Annals of Scottish Natural History. 1911. Edinburgh.

Not many articles in connection with entomology are to be found in the volume just completed; perhaps when the 'Annals' appear in 1912 under a new form this may be remedied. There are two papers of considerable importance:—"Scottish Dragonflies; some further Records and Table of Distribution," by W. Evans; and "The Aquatic Coleoptera of the North Ebrides," by F. Balfour-Browne, M.A. Shorter papers are:—"On some New and Rare Scottish Diptera," by A. E. J. Carter; and the Scottish species of *Oxyura* (Proctotrypidæ), pt. vi., by P. Cameron. Short notes on "*Labia minor* (Orthoptera) in Haddingtonshire," by W. Evans; *Acherontia atropos* (Lepidoptera) in Caithness," by W. Evans; and "Northern Records of Diptera," by Col. J. W. Yerbury, complete the list.

W. J. L.

Social Life in the Insect World. By J. H. FABRE. Translated by BERNARD MIALL. With Fourteen Illustrations. Fisher Unwin. London, 1912. Price 10s. 6d. net.

THE lover of insect life who has not yet read any of the delightful essays written, under the title of "Souvenirs Entomologiques," by J. H. Fabre, would be well advised to begin reading them at once. Darwin used no words of flattery when, in writing to the author soon after the publication of his first volume, he said: "Never have the wonderful habits of insects been more vividly described, and it is almost as good to read about them as to see them." Nothing could be truer. Fabre was not only a great and accurate observer,

but possessed to an exceptional degree the gift of enabling others to see the things that he himself had seen. Many of his essays are now to be had in English translations. The volume under notice contains fifteen of them, all of absorbing interest, and rendered in a style that has lost little of the lucidity and charm which characterize the originals. Instead, however, of the ants, bees or wasps, which the title of the volume suggests, the insects treated of are mostly creatures of quite different habits and character—cicadas and crickets, the grey locust, the golden *Carabus* and beetles of other kinds, the praying mantis, the great peacock or emperor moth, and the oak-egger, with a few more insects whose habits of life are not usually described as social.

If the names just mentioned are not all to be found within the pages of the book, it is the translator's fault, not ours. His work on the whole would have deserved nothing but praise, had he not shown too great a want of care where the names of insects are concerned, turning as he does, on every possible occasion, a *Carabus* into a *Scarabæus*, a locust into a cricket, or a moth into a butterfly. Transformations of that striking character are merely disconcerting to the reader, and do not in the least add to the attractiveness of the volume.

C. J. G.

Ichneumonologia Britannica. The Ichneumons of Great Britain; a Descriptive Account of the Families, Genera, and Species indigenous to the British Isles, together with Notes as to Classification, Localities, Habitats, Hosts, &c. Tryphoninæ, iv. By CLAUDE MORLEY, F.Z.S., F.E.S. Pp. i.-xvi. 1-341. H. & W. Brown, 20, Fulham Road, London, S.W. 1911.

To the student of Ichneumonidæ these volumes should be a boon. The present one is not only of the same high standard as those preceding it, but its general usefulness is, perhaps, even greater because of the excellent illustrations in the text. These figures, reproduced from enlarged engravings by Mr. Rupert Stenton, represent one species of almost every genus treated in the volume.

In 1901 the number of British species of Ichneumons referred to the subfamily Tryphoninæ appears to have been something over four hundred. Under our author's revision the total now barely exceeds three hundred and thirty. These are treated under five tribal headings as follows:—

	Genera.	Species.
Tribe Metopiides.....	1	5
„ Sphinctides	1	1
„ Exochides	10	75
„ Bassides.....	6	48
„ Tryphonides	32	205
	50	334

So far as known, the Metopiides prey upon larvæ of moths, chiefly species of the so-called “Bombycidæ.” *Sphinctus serotinus*, apparently the only Palæarctic member of the tribe Sphinctides, is parasitic on *Limacodes testudo*. Species belonging to Exochides

also attack lepidopterous larvæ, largely those of the Tortricina and Tineina. The Bassides, owing to their penchant for larvæ of Syrphidæ which draw their sustenance from Aphidæ, may be regarded as injurious insects. The Tryphonides destroy sawflies, and for this reason, considered from an economic point of view, are useful members of the insect world.

United States Department of Agriculture—Bureau of Entomology :—
Bulletins :—

No. 96. Parts i-iv. "Papers on Insects affecting Stored Products." By F. H. Chittenden. (March-October, 1911.)

No. 97. Parts i-v. "Papers on Deciduous Fruit Insects and Insecticides." By F. Johnson, S. W. Foster, Dudley Moulton, & R. A. Cushman. (March-November, 1911.)

No. 99. Part i. "The Orange Thrips (*Euthrips citri*)." By P. R. Jones & J. R. Horton. (March, 1911.)

No. 104. "The Fig Moth." By F. H. Chittenden, Sc.D. "Report of the Fig Moth in Smyrna." By E. G. Smyth. (November, 1911.)

No. 105. "The Rocky Mountain Spotted Fever Tick. With Special Reference to the Problems of its Control." By W. D. Hunter & F. C. Bishopp. (November, 1911.)

No. 109. Parts i & ii. "Papers on Insects affecting Vegetables." By H. O. Marsh & F. H. Chittenden, Sc.D. (November, 1911.)

Technical series :—

No. 16. Part iv. "Catalogue of Recently Described Coccidæ."—iii. By E. R. Sasser. (June, 1911.)

No. 19. Part iii. "Investigations into the Habits of Certain Sarcophagidæ." By T. L. Patterson. (March, 1911.)

No. 20. Parts i-iv. "Technical Papers on Miscellaneous Forest Insects." By A. D. Hopkins, Ph.D. & S. A. Rohwer. (January-May, 1911.)

THE current "Transactions" of the Norfolk Society is a little disappointing entomologically, and contains but a single note on the occurrence at Carrow of the latest indigenous specimen of *Xylophasia zollikoferi*, under a large electric lamp. Five British examples are known from Deal to Yorks, and the species has a wide distribution from Germany to Central Asia, though always taken singly. We shall hope to find Rev. E. N. Bloomfield's important Catalogue of the Norfolk and Suffolk Diptera in next year's account of this thriving Society. The Ipswich Field Club is beginning to assert itself, early for so young an institution, and prints in its current Journal a capital list of Lepidoptera, taken in its vicinity by the Rev. A. P. Waller, B.A., who has, however, confined himself to the eastern side of the town, especially about Waldringfield, of which he is Rector. The most interesting note is anent *Leucania favicolor*, which he anticipates will be found nothing but a local form of *L. pallens*.

WE much regret that we have to postpone publication of the biographical notice of the late Mr. S. J. Capper until next issue.



NEAR PUERTO DE LA LOSILLO, SIERRA ALBARRACIN



Photo Dr. Fr. Ris. IN THE CAMARGUE, NEAR LES SAINTES MARIES.

THE ENTOMOLOGIST

VOL. XLV.]

APRIL, 1912.

[No. 587

A COLLECTING TRIP TO THE CAMARGUE AND THE SIERRA ALBARRACIN.

By KENNETH J. MORTON, F.E.S.

(PLATE III.)

ON July 2nd last I joined my friend Dr. Ris, of Rheinau, at Lyons, our destination being Arles, in the Bouches du Rhône, which we reached early on the same day. In selecting Arles as the starting-point of a collecting trip which we had long planned, we had the belief that the Rhône delta would prove an excellent locality for Odonata, while we had also the idea that the chain of les Alpines might yield us a good Ascalaphid or two. We had even a faint hope that *Macromia splendens*, one of the least known, and accordingly one of the most interesting, of our European dragonflies, which apparently has not been taken at all in quite recent times, might be met with. Of these beliefs and hopes only the first was realized. The waters around Arles proved most productive of Odonata, but we did not see *Macromia splendens* at all, nor are we able to explain why we did not do so. Whether we were too far east, the character of the waters was unsuitable, or the season still too early, we are unable to say. The two recorded localities are Montpellier, in the not far-off Department of the Herault, and Jarnac, in the Charente; and probably we should have fared better had we tried one of these known localities. But my own feeling is that we were perhaps too early, as Williamson, in his excellent paper on the North American species of *Macromia*, states that on the Wabash River these magnificent insects appear on the hot days at the end of July and early August, when most of the other species of summer dragonflies have passed away—a state of things which, as the list that follows will show, had not yet come to pass at the time of our visit to Arles.

Our first attempt at collecting was made at the canal just outside of the town, and on most of the days that followed we spent a few of the morning hours profitably in the same place. Here we met with some of the most interesting small species in

plenty, such as the two species of *Platynemis*—*acutipennis* and *latipes*—the latter an especially delicate ivory-white species with a peculiar, weak, jerky flight. *P. pennipes* was not present at all. *Agrion lindenii* was also common here. Of the Gomphinæ, *Gomphus pulchellus* was common, *simillimus* much rarer, while a single male of *G. flavipes* was quite a distinguished capture. *Anax imperator* here and there patrolled the canal, but, as de Selys naively remarks, "cet insecte est d'une prudence remarquable." *A. parthenope* was also seen more rarely, and Dr. Ris picked up the exuvie of this species. *Æschna affinis* occurred occasionally with an odd specimen or two of *Oxygastra curtisii*. Of the Libellulinæ, *Libellula fulva* and *Orthetrum cancellatum* were perhaps the most conspicuously common here, while *O. brunneum*, *O. cærulescens*, and *Crocothemis erythræa* occurred more sparingly. At this very convenient locality, towards the end of our stay at Arles, Dr. Ris made an interesting discovery in the shape of *Erythromma viridulum*. It was found settling in some numbers amongst poplar-shoots which grew in a clump at one point of the canal-bank, and it might very easily have been overlooked. Later it was seen flying in its more normal fashion over the water, and settling on water-lily leaves. Another insect particularly common at one of the canal-locks was *Calopteryx splendens*, of an interesting form, similar to that which is found at Digne, somewhat intermediate between the type and the form *xanthostoma*.

On the afternoon of the 2nd we went further into the Camargue at Albaron, a station on the railway which goes to les Saintes Maries. All the way down we saw from the train many examples of what was doubtless *Æschna affinis* flying about, and at Albaron itself this species was in the greatest abundance. It is difficult to imagine one of the *Æschninæ* existing in greater numbers in any locality. Both sexes were represented. The other dragonflies noticed were not of great importance, but a single *Ascalaphus ictericus* was an interesting addition to our list for the day.

Another part of the district which we visited frequently was that lying around the station named Mas de la Ville, on the Saint Louis line. Here there were to be found, in addition to the canal, smaller ditches of diverse character, more or less overgrown with aquatic vegetation, and producing some species which did not occur nearer the town. At one of the minor ditches a few *Agrion mercuriale* and *Pyrrhosoma tenellum* were taken, while at another one or two *Calopteryx hæmorrhoidalis* put in an appearance. A shaded pathway running parallel to one of the greater ditches was a favoured haunt of the *Lestes* group. Here *L. viridis*, *barbara*, and *S. fusca* were common. Along the same pathway *O. curtisii* was found, but this species was disappointingly scarce. It is common in West Central

France (Indre and no doubt elsewhere), and it appears to be more especially an occidental species, although it is also recorded from Italy and Southern Spain. *Æ. isosceles* was a somewhat unexpected capture, some of the males being still in perfect condition. Looking to the time of its appearance in more northerly localities, its occurrence here in July was a little puzzling, and one or two other species, such as *L. fulva* and *L. quadrimaculata*, were equally a surprise to us at this date. The last-named occurred frequently in this district, and *Crocothemis erythraea* was very common. Anyone who has never before seen *Crocothemis* alive cannot fail to be struck by the beauty of the mature males of this tropical-looking insect. *S. sanguineum* was also a common insect in this quarter, in which the only Gomphine taken was *G. pulchellus* in great abundance.

We devoted one day to a visit to les Alpines. We took train to Fontvieille, and explored the hills lying between that place and Paradou. At the foot of the hills many *Æschne* were flying about, probably *affinis* and *mixta*. The butterfly-hunter would no doubt have found this a good locality (and very likely better still a little earlier in the season). I was sorry that we neglected butterflies, as our efforts to collect Neuroptera did not result in much. Flying in grassy places near olive-trees a small series of *Ascalaphus longicornis* was taken, and in one place we noticed a number of *Cordulegaster annulatus*, specimens secured proving to be of the var. *immaculifrons*, quite similar to those I have taken at Digne. *Æ. mixta* (female) was taken in the hills.

An excursion to les Saintes Maries, on the Mediterranean, which enabled us to see something more of the great wastes of the Camargue, was of little consequence from a collecting point of view. But even in this region, where arid tracts sparkling with saline efflorescence are the most conspicuous feature, dragonflies were not altogether absent, such species as *Anax imperator*, *Orthetrum cancellatum*, and *Lestes barbara* having been observed.

The following is a full list of Odonata seen and with one exception (*Anax parthenope*) taken in the Bouches du Rhône between July 2nd and 10th:—*Calopteryx splendens*, Harris; *hæmorrhoidalis*, V. d. Lind. *Lestes viridis*, V. d. Lind.; *sponsa*, Hansem; *barbara*, Fab. *Sympycna fusca*, V. d. Lind. *Platycnemis acutipennis*, Selys; *latipes*, Ramb. *Agrion lindenii*, Selys; *puella*, L.; *pulchellum*, V. d. Lind. (one female); *mercuriale*, Charp. *Erythromma viridulum*, Charp. *Pyrrhosoma tenellum*, Devillars. *Ischnura elegans*, V. d. Lind. *Cordulegaster annulatus*, Lat. *Gomphus simillimus*, Selys; *pulchellus*, Selys; *flavipes*, Charp. *Æschna affinis*, V. d. Lind.; *mixta*, Lat.; *isosceles*, Müll. *Anax imperator*, Leach; *parthenope*, Selys. *Oxygastra*

curtisii, Dale. *Orthetrum cancellatum*, L.; *brunneum*, Fonscol.; *cærulescens*, Fab. *Libellula fulva*, Müll.; *quadrimaculata*, L. *Crocothemis erythræa*, Brullé. *Sympetrum sanguineum*, Müll.; *meridionale*, Selys; *fonscolombii*, Selys.

Of four *L. quadrimaculata*, two are ab. *prænubila*; another has the nodal spot just indicated, while the fourth has this spot very large, extending to 7 mm. in the hind wings.

Leaving Arles on the evening of July 10th, we proceeded to Albarracin, in the province of Teruel, by way of Cerbere, Barcelona, Sagunto, and Teruel. At ornamental waters in public gardens at Barcelona, dragonflies were about in some numbers, including *Anax imperator*, *Orthetrum cancellatum*, *Sympetrum fonscolombii*, and, I believe, one or two other species. We arrived at Albarracin on the 14th, and remained there until the 25th. This beautiful district has already been much written about by English entomologists, and its productions, especially in the way of butterflies, are well known. The Neuropteroid insects are also fairly well known, and quite a strong representation of these already existed in my collection, taken by Dr. Chapman, Miss Fountaine (through whose kindness I received a rather large collection), and Father Navás. In fact, we hardly added anything at all to what we previously knew of the "Neuroptera" of the district, and I fear we did not work so strenuously for these things as we ought to have done; they were not numerous (with a few exceptions), and the butterflies proved a counter-attraction at times irresistible.

On the way to Albarracin we had an afternoon at Teruel, and there we found three dragonflies in abundance, viz. *Calopteryx splendens* (race *xanthostoma*), *C. hæmorrhoidalis*, and *Onychogomphus uncatus*. In the valley of Guadalaviar, near Albarracin, *C. splendens* and *O. uncatus* were also common. Members of the genus *Sympetrum*, including *striolatum*, *meridionale*, *fonscolombii*, and *flaveolum*, *striolatum* preponderating, swarmed; and multitudes of these might be seen settled on the telegraph-wires, basking in the very early morning sunshine. Other species seen in the valley were *Lestes barbara*, *Sympycna fusca*, *Orthetrum brunneum*, and *Libellula depressa*. Examples of *Æschna* were occasionally seen, probably *mixta* and *cyanea* (the latter was taken by Miss Fountaine).

On the way to the Puerto de la Losillo we saw more than once *Cordulegaster annulatus*, but did not take any (the var. *immaculifrons* was received from Miss Fountaine), and at springs in an open grassy place amongst the pines, *Agrion puella*, *Ischnura graellsii*, *Sympycna fusca*, and *Lestes dryas* were found. *Æschna mixta* (male) was also taken in an open part of the pine-woods.

The insects which interested us perhaps as much as any were the two species of *Ascalaphus*—*longicornis* and *bæticus*. They were seen in many different places, but in some rough

overgrown spots near the river a few miles below Albarracin they existed in great numbers. They were given to occasional long soaring flights, beautiful manifestations of activity and life. When on the wing they were by no means easy of capture, but my observant friend, who always seemed to achieve maximum results with a minimum of exertion, found out another way. Settling quietly after a flight, they rest on stems for a brief space with fully outstretched wings. They are then conspicuous and easy to take until the wings are gradually closed over the back, when they become more difficult to see. One large example of *A. longicornis* was captured in the grip of an Asilid fly.

The following other Neuroptera were taken:—*Chrysopa prasina*, *lineolata*, and *vulgaris*; *Hemerobius humuli*, *H. stigma*; one example of *Dilar* (taken by Dr. Ris), probably *meridionalis*; *Macronemurus appendiculatus* and *Creagris plumbeus*.

Plecoptera were represented by *Perla marginata* and *Chloroperla grammatica* at the Guadalaviar, while a good series of *Nemoura fulviceps* was found at a small stream on the way to Puerto de la Losillo.

Probably the Guadalaviar produces more species of Trichoptera earlier in the season. *Hydropsyche lepida* and *Metatype fragilis* were common, and flew to the lights in the Posada. Other species were *Hydropsyche instabilis* and *guttata*, and *Sericostoma vittatum*, the last-named being common at the small stream above mentioned. The only example of Hydroptilidæ taken was unfortunately lost.

Going over ground that has been so well worked by experienced lepidopterists, little that is novel can be expected in the record of our doings amongst the butterflies. No doubt we overlooked much and made some mistakes. Amongst many specimens of *Melanargia lachesis*, I find but one pair of *M. japygia*. Of course, the latter may not have been fully out. On the other hand, *M. uez* was found here and there, mostly in rather chipped condition, it is true, but the species appears to have been missed altogether by most of our predecessors. A single specimen of *Cænonympha iphioides* occurred in a meadow-like opening in the woods near the Puerto de la Losillo. We appear to have expended a tremendous amount of energy on *Satyrus briseis*, the result being a long and fine series, while of the much-desired *S. priouri* my total catch amounts to only three males, and my colleague reports that his is about the same. On the whole, however, we seem to have met with most of the species that were to be looked for at the time of our visit.

On our way back from Albarracin we spent part of a day at Narbonne. Neither of us was particularly fit, and it began to dawn upon us that there might be something in the remarks that we had been hearing about the heat! We had practically no collecting, but it was interesting to see *Sympetrum fons-*

colombii, both sexes, in abundance here. Other species which were common were *Calopteryx splendens* (the southern form, different from that found at Arles), *Agrion lindenii*, and *Platynemis latipes*.

BRITISH ORTHOPTERA IN 1911.

By W. J. LUCAS, B.A., F.E.S.

(PLATE IV.)

THOUGH nothing of special importance occurred during the year just passed in connection with the British Orthoptera, yet a few facts which have come to my knowledge should, I think, be put on record; for it is only by persistent observations, each one of little consequence perhaps in itself, that we shall ever become well acquainted with the distribution and habits of the British examples of this important Order of insects.

Forficulodea.—On July 16th Mr. J. R. le B. Tomlin sent me some specimens of the little earwig (*Labia minor*), which he said were then common in his garden at Reading. Of the common earwig (*Forficula auricularia*), Col. J. W. Yerbury brought me a few examples from the North of Scotland. One fine large male was taken at Spey Bridge on July 31st. Large specimens of the var. *forcipata* are not infrequent, but this is, I think, the finest example of the normal form that I have seen. Its total length is 20·5 millimetres, 5·5 of them being due to the callipers, which are of the ordinary circular shape. There were also two nymphs of the same species, “swept in a damp shady spot” at Lochinver on July 11th, and two other nymphs “found under stones and cow-dung near Glencanis Lodge,” Lochinver, on June 21st. On October 14th I took a female of this species on ivy-blossom in a garden at Eltham, in Kent. Mr. Burr tells me that he took *Apterygida albipennis* in 1911, at Beachborough, behind Folkestone, in Kent.

Blattodea.—During 1911 the cockroaches have not been to the fore, and I have but a single note. Mr. Burr, writing early in February, 1911, told me that, on January 31st, when the “country was iron-bound in a black frost,” he found *Blattella germanica* and *Blatta orientalis* swarming within a rubbish-heap in a brick-yard near Cheriton, Kent. Though the weather was very cold, the fermentation in the large heap of ashes and refuse produced much heat. In this case, of course, the congenial warmth accounts for the presence of these cockroaches out-of-doors. To find such insects, which are not indigenous with us, under these conditions at any time is very unusual, and much less do we expect to meet with them abroad in the winter.

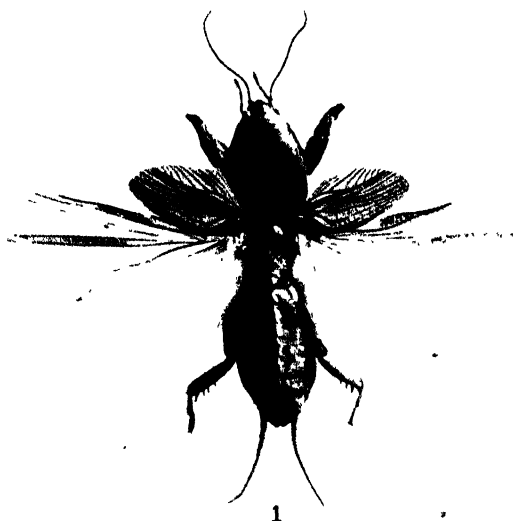
Grylloidea.—*Gryllotalpa gryllotalpa*, the mole cricket, appears to be seldom noticed in Britain, though it is possibly not so scarce as this would imply. Like its namesake with the velvet fur, it is an underground animal, and may therefore very easily escape notice. I know of but one locality where it is permanently established. At a spot in the neighbourhood of Ramnor, in the New Forest, one of the keepers seems at any time to be able to obtain specimens by digging for them in the clayey soil. It is from this source that Mr. A. J. Scollick obtained a nice specimen in July last, whose extreme length was about 50 millimetres, while the expanse of its wings was about 66·5. Perhaps other entomologists may know where this—one of the finest of British insects—has permanent colonies. Mr. J. G. Dalgliesh is accustomed to receive living examples from Guernsey. Figures are given to enable anyone unacquainted with the insect to identify it. On November 12th last I received from Mr. G. T. Lyle a male specimen of the little “wood-cricket” (*Nemobius sylvestris*), which he found hopping about amidst fallen leaves, on the 5th of the month, in Pignall Wood in the New Forest. It seems quite likely that this insect may, to some extent at least, hibernate as an imago, for Mr. Lyle also found, in the New Forest, on February 12th, 1910, a female imago, which he forwarded to me alive (*vide* Entom. vol. xliii. p. 98). On August nights in the Forest, when scarcely a living thing betrays its presence by sound, a quiet chirping is occasionally heard, which I presume is due to this little cricket.

Locustodea.—Writing from the New Forest on October 19th, Mr. Lyle told me that, while sugaring that evening at 6.45, he noticed a grasshopper, *Meconema thalassinum* (= *varium*), ovipositing in the chinks of the bark of an oak-tree. The ovipositor was inserted to half its length. A second insect was also noticed in a similar position on a neighbouring tree. I suggested that, since it was not possible to obtain a photograph at night, Mr. Lyle should make an accurate sketch of the insect as it was probing the bark, and, having mounted a specimen in exactly the same position, photograph it at home. This he had no difficulty in doing, for on visiting Holland’s Wood a night or two afterwards, the grasshopper could be found ovipositing on every fifth or sixth tree. This plenty continued till October 27th, but when Mr. Lyle paid another visit on November 14th he could not detect a single individual. Writing on July 15th, Mr. H. Campion reported to me a case of cannibalism in a Locustid grasshopper. Two specimens of *Metrioptera brachyptera* were taken by Mr. South at Oxshott, on July 1st. One cast its skin in a glass-bottomed box and later made a meal of the skin. For some days the two specimens of *M. brachyptera* were kept in a fish-globe with a *Gomphocerus maculatus*, also from Oxshott. One night the *G. maculatus* looked a little

sluggish. The next morning it was dead, and one of the Locustids was feeding on it (*vide* Entom. vol. xliv. p. 275). In August Mr. South took a single specimen of the very scarce *Metrioptera roeselii* at Leigh, in Essex.

Acridiodea.—Short-“horned” grasshoppers are usually more in evidence than those with the long antennæ, and fresh references to the former have therefore been the more numerous during the past year. Mr. S. E. Brock records *Gomphocerus maculatus* from Linlithgowshire, at Craigton (plentifully), at Priestwich, and at Linlithgow; and notes that it was already stridulating on June 25th. Personally, I did not notice it mature till July 10th, when it was found just outside the ‘Hand and Spear’ at Weybridge, on the evening of the Entomological Club Supper at that well-known hotel. Mr. W. Evans took the female* at Aberdour, in Fife, on August 15th. Colonel J. W. Yerbury sent me eighteen specimens from Nethy Bridge—a male and female taken on August 9th; five males and seven females on August 11th; and two males and two females on the 18th. I received a female from Mr. K. J. Morton, taken at Llanfaethlu, in Anglesey, August 1st–7th, 1911. Rev. F. C. R. Jourdain took a female in the late summer, at Dovedale, in Derbyshire. *Omocestus viridulus* is reported by Mr. Brock from Drumshoreland, in Linlithgowshire, and from Craigton in the same county plentifully. Mr. Evans took both male and female at Aberdour, in Fife, on August 15th. Colonel Yerbury sent me, from Nethy Bridge, a male taken July 30th; a male, August 9th; a male and four females, August 11th. Mr. Jourdain took a female in Dovedale. Of *Stauroderus bicolor* Mr. Evans took the female, at Port Seton, in Haddingtonshire, on August 11th, and both male and female at Waughton, in the same county, on October 14th (his latest date for the species). Colonel Yerbury gave me three specimens, two males and a female, of a dull reddish brown tint, taken October 13th, in Cornwall, at Dundererry, which is on the shore of Whitesand Bay, between Plymouth and Looe. Mr. Morton sent me a male taken at Llanfaethlu, in Anglesey, August 1st–7th. A male was taken in late summer by Mr. Jourdain at Dovedale. Mr. Brock says that *Chorthippus parallelus* was in considerable numbers at Drumshoreland, in Linlithgow, being in full “song” on July 10th. Colonel Yerbury sent four nymphs, taken at Lochinver on July 1st, 4th, 12th, and 22nd, all of which must no doubt be referred to this species. *Mecostethus grossus* seemed to be mature in the New Forest somewhat earlier than usual, as, of course, was to be expected. Several females of *Tetrix bipunctatus* were secured in West Perthshire, at Lochard, by Mr.

* In this and similar cases, unless it is expressly so stated, it must not be supposed that only the individuals mentioned were in evidence, or that the sex not mentioned was absent from the spot at the time.



W J Lucas)
H Mun) photo
G T L'le)

West, Newman proc

1. *GRYLLOTALPA GRYLLOTALPA* (Mole Cricket), wings spread.
 2. *G. GRYLLOTALPA*, wings folded.
 3. *MECONEMA THALASSINUM*, ovipositing.
- All nat. size.

Evans, on May 27th, while Colonel Yerbury sent me a specimen with broad yellowish stripe along the middle of the pronotum, taken at Lochinver on June 20th; and one very dark example with pronotum extending a little beyond the hind knees, taken at Nethy Bridge on August 9th. This latter looked as if it might be *T. fuliginosus*, but the announcement of this insect as British is not yet to be.

In the hot sunshine of July 11th, on the downs near Clandon (Surrey), and again in the New Forest, when the sun on August 7th was very bright and very hot, especially in sheltered places, I particularly noticed that grasshoppers were chirping merrily; yet Tennyson writes:—

“For now the noonday quiet holds the hill
The grasshopper is silent in the grass”;

while another author, speaking of “autumn calm,” says:—

“Scarce a chirping grasshopper is heard
Thro’ the dumb mead.”

On the other hand, Keats writes:—

“When all the birds are faint with the hot sun,
And hide in cooling trees, a voice will run
From hedge to hedge about the new-mown mead
It is the grasshopper’s . . .”

Can these three statements be reconciled?

DESCRIPTION OF PLATE IV.

Gryllotalpa gryllotalpa, with wings spread.
“ ” “ ” with wings closed.
Meconema thalassinum ovipositing.

Kingston-on-Thames: February, 1912.

NOTES ON BRITISH OCCURRENCES OF *METRIOPTERA* (*PLATYCLEIS*) *ROESSELII*, HAGENB. (ORTHOPTERA).

BY HERBERT CAMPION.

ON August 1st, 1911, Mr. R. South was fortunate enough to take a fine male of this scarce British Locustid near Leigh, Essex. It was found amongst long dry grass at the foot of one of the ramparts which serve as sea-walls on that part of the coast. A few days later—August 10th—he revisited the locality, and spent a considerable time in searching for further specimens, but without success. Mr. South very generously gave me his single example, which I received alive. I fed it upon fresh grass, and it was still quite active when I killed and set it on August 21st.

As this species is so little known to British entomologists as a living insect, and in view also of the fugitive character of its

coloration, it may be useful to place on record the colour-characters of the Essex male, which were as follows:—

Head ash-colour. Palpi brownish. Eyes brownish black, with a horizontal black streak above each, partially bordered below with yellow. Antennæ light brown. Pronotum pale brown; side-flaps black, edged all round with bright yellow. Elytra lightly tinged with brown; principal longitudinal nervures black. A pair of bright yellow spots on each side of the thorax. Legs light brown; black lines on hind femora; inferior surface of tibiae of fore and mid legs greenish. Abdomen dorsally and superior appendages dull brown; ventral surface and inferior appendages deep yellow; a row of light yellow markings along each side of the abdomen.

Leigh can now be added to the very few British localities hitherto recorded for *M. roeselii*, which seems to show a preference for the East Coast. It is not to be assumed, however, that this distribution is due to immigration from the Continent, as that supposition appears to be excluded by the ill-developed condition of the wings in this Decticine.

From Trusthorpe, Lincolnshire, Mr. Eland Shaw received specimens taken in August, 1888 (Ent. Mo. Mag. s. i. p. 96, 1890).

At Herne Bay, Kent, the species has been met with by more than one collector. Mr. E. Saunders took a specimen in August, 1886 (Ent. Mo. Mag. *loc. cit.*), and a male contained in Mr. Guermontprez's collection is recorded in Entom. xxx. p. 28, 1897. Another isolated specimen, a female, was obtained by myself on September 13th, 1907 (Entom. xl. p. 255, 1907), although I have never been able to re-discover the species in or about the locality where I took it in that year. Mr. Charles O. Waterhouse, however, appears to have found the insect in some numbers, for the British Museum cabinet of British Orthoptera contains seven examples (five males and two females) of *roeselii* from its Kentish haunt. These formed part of a collection of eighty insects of various kinds made by him in the neighbourhood of Herne Bay at the end of July and the beginning of August. The collection is registered as having been presented to the Museum in 1887, and Mr. Waterhouse tells me it is almost certain that his specimens were taken in that year, the great majority of them in the month of July. A female pupa, taken on the same occasion, is now, through the kindness of Mr. Waterhouse, in my own collection.

With Mr. Waterhouse's specimens are placed a pair derived from Stephens' collection. As was to be expected, they are without data, but the male carries the printed name "*Roeselii, Hage.*" Dr. Malcolm Burr has been good enough to examine the specimens for me, and has pronounced both of them to be correctly identified as *roeselii*. All that is discoverable con-

cerning their history is contained in the following passage from Stephens:—"This species appears to be very rare in this country. I have hitherto seen, so far as I remember, two examples only, which are in my own collection, and were found in the vicinity of the Metropolis in the autumn, I believe at Hampstead" (Illus. Brit. Ent. Mandib. vi. p. 13, 1835).

In 1850, J. C. Dale presented to the British Museum, among other insects, a pair of *Metrioptera* from Parley Heath, Hants, which were believed to be "*Acrida brevipennis*," Charp. (= *M. roeselii*, Hagenb.), and were referred to under that specific name in Walker's Cat. Derm. Salt. in B. M., part ii., p. 256 (1869). In the Museum collection, however, the specimens stand over the name *brachyptera*, Linn., and Dr. Burr has kindly informed me that they are correctly placed.

Assuming that Mr. Waterhouse's specimens were taken in July, it follows that the ascertained seasonal range of *roeselii* in this country extends from the latter part of that month to September 13th, the date noted by myself. Judging by analogy with allied species, however, our insect might be expected to survive until about October.

58, Ranelagh Road, Ealing: March 2nd, 1912.

SOME BEES OF THE GENUS *NOMIA* FROM AUSTRALIA.

By T. D. A. COCKERELL.

Nomia flavoviridis, Cockerell.

I HAVE before me a series of eight males and seventeen females collected by Turner at Mackay, Queensland; some of the females from flowers of *Cassia* and *Xanthorrhœa*. I have also eight males from Cooktown, October, 1902 (Turner), four males from Townsville (Dodd), and a female collected at Cheltenham, Victoria, by French (Froggatt collection, 96). The abdominal bands vary in colour from pale yellowish to white in the males, and in the females are frequently orange. Both sexes are occasionally only rather feebly metallic. So far as can be gathered from Smith's brief account of male *N. ænea* from Port Essington, the only conspicuous and constant difference between that species and *N. flavoviridis* is found in the hind femora, which in *ænea* are more slender than in male *flavoviridis*, and have the apical part much more narrowed and elongated.

The great variability of *N. flavoviridis* makes the classification of the varieties difficult. None of the specimens now before me are var. *adelaidella*, Ckll. The typical *flavoviridis* is represented only by two males and a female from Mackay, characterised by

the clear rufo-fulvous or apricot colour of the tegulæ, and in the male by the red tibiæ (wholly red or stained with metallic greenish) and tarsi. The female has pale orange hair-bands. The other specimens all have darker tegulæ, and the legs show more dark colour, being better described as dark stained with reddish. The colour of the body seems quite inconstant, the Mackay males varying from green to deep blue. It therefore seems impracticable to maintain the variety *doddii*, Ckll., unless it is considered to include all of the Queensland material excepting the three typical *flavoviridis* cited above. The female from Victoria is olive green, and has the face narrower than usual. Three females from North-west Australia (French) have very broad faces; they perhaps represent a distinct race.

Nomia frenchi, sp. n.

♂. Length about $7\frac{1}{2}$ mm., expanse nearly 18; black, densely punctured, with dull white and black hair; antennæ very long, entirely black; clypeus black, somewhat bigibbous, shining, with elongate punctures; labrum and mandibles ferruginous, the latter black at tip; tongue narrow, moderately long; hair of face white, strongly plumose, of vertex fuscous, of occiput white; mesothorax uniformly densely punctured, with a thin short mouse-coloured tomentum, and longer black or dark fuscous hair; scutellum with long dark hair; other parts of thorax with pale hair; basal transverse canal of metathorax quite broad, shining, very finely fluted; apical triangular part of enclosure smooth and shining; tegulæ rather large, bright ferruginous, pointed behind; wings dusky translucent, nervures and stigma ferruginous; first r. n. entering apical corner of the narrow second s. m.; femora black, tibiæ and tarsi ferruginous, the middle and anterior tibiæ suffused with dusky; hind femora thickened, smooth, flattened and longitudinally concave beneath; hind tibiæ thickened, trigonal, the lower margin obtusely angled about the middle; abdomen black, densely punctured, the hind margins of the second and following segments smooth, the fourth and fifth becoming brownish; fourth ventral segment emarginate; no ventral tubercles or teeth.

Hab. Woodend, Victoria, 1909 (French). Froggatt collection, 92. A distinct species, readily separated from *N. generosa*, Smith, by the enlarged hind femora and tibiæ, and the dark hair on the thorax above; and from *N. argentifrons*, Smith, by the black flagellum, the red tibiæ and tarsi, &c. The abdomen has greyish-white hair-bands on the second and following segments, that on the second broadly interrupted, but the basal parts of the third and following segments have long coarse black or dark fuscous hair.

Nomia satelles, sp. n.

♂. Length about $8\frac{1}{2}$ mm.; black, finely and closely punctured; hair on face dense, shining, with a yellowish-grey tint, on thorax above of the same colour, with scattered dark hairs intermixed, on

pleura and sides of metathorax thin and white; tongue elongate dagger-shaped; lower half of clypeus, and mandibles except at base, honey-colour; vertex and cheeks very narrow; antennæ long, the flagellum entirely ferruginous, but darker above; mesothorax shining between the close small punctures; basal transverse channel of metathorax shining, crossed by numerous strong ridges; apical triangle of enclosure small, smooth; tegulæ rather large, apricot colour, the margin paler; wings hyaline, faintly dusky; nervures and stigma ferruginous, first r. n. joining apical corner of second s. m.; legs with coarse white hair; knees and tarsi clear ferruginous, tibiæ ferruginous at each end, as also anterior pair in front, and hind ones largely behind; hind femora swollen, shining; hind tibiæ swollen, trigonal, but wholly without the median tooth or tubercle found in *N. smithella*, Gribodo; abdomen finely but very distinctly punctured, with very broad pale orange hair-bands on the hind margins of the segments except the first, which has only an elongate patch on each side; venter without teeth or tubercles, hind margin of fourth ventral segment concave.

♀. Length about $9\frac{1}{2}$ or 10 mm.; similar to the male except for the usual sexual differences; hair on last two abdominal segments pale purplish-sooty, but the orange bands on the other segments as in the male; mesothorax with very minute punctures, and scattered large ones; mandibles dark; flagellum dark above, clear ferruginous beneath; hair on inner side of basitarsi fulvous.

Hab. Type (male) from Rutherglen, Victoria, 1909 (French); Froggatt collection, 84. Female from Mittagong, New South Wales, January 10th, 1902 (Froggatt, 73). This species resembles *N. australica*, Smith, from which it is easily known by the smaller size and black colour. The first abdominal segment of the female is closely and finely punctured on the disc as in typical *australica* from New South Wales.

Nomia kurandina, Ckll.

I have a male from Kuranda, Cairns, March, 1902 (Turner), and two females from Mackay, Queensland, November, 1891, and May, 1900 (Turner, 1078). The female, not before known, is exactly like the male except for the usual sexual differences, and the more dilute dark apices of the wings. The clypeus and supraclypeal area show a strong median ridge. The mesothorax has very fine punctures, with scattered larger ones.

Nomia semiaurea, Ckll.

Mr. Turner collected females in Queensland, at Mackay, March, 1900, and at Cairns (Kuranda), April, 1902. At Kuranda, February, 1902, he collected a male *N. rufocognita*, Ckll. When describing *N. semiaurea* I suggested that it might possibly be the female of *rufocognita*, and I am now of the opinion that this is really the case, though actual proof is wanting.

Nomia halictella, Ckll.

The male, hitherto undescribed, was taken at Mackay, January and March, 1900 (Turner, 314). It has a subclavate abdomen, and resembles *N. pseudoceratina*, Ckll., but is smaller (length about or hardly 8 mm.), with the first abdominal segment only about as long as broad; hind knees and base of their tibiæ ferruginous; hind femora and tibiæ quite simple.

University of Colorado, Boulder:
January 18th, 1912.

NOTES ON THE LIFE-HISTORY OF *COLIAS NASTES*
VAR. *WERDANDI*, WITH DESCRIPTION OF OVA
AND LARVA.

By W. G. SHELDON, F.E.S.

WHILST staying in Swedish Lapland last summer I searched for and succeeded in finding ova of this species. The first ova, ten in number, were found on June 23rd in a sheltered spot on the shores of the Torne Traske, where its food-plant, the handsome *Astragalus alpinus*, grew abundantly. Most of the ova were found on the leaflets of the *Astragalus*, some on the upper and some on the lower surfaces, but in two cases they were attached to a leaf of *Vaccinium myrtillus*, which was an inch or two away from the food-plant. I did not search further for ova for some days, the supply obtained appearing sufficient for the time being, but in early July I sleeved several females, which deposited sparingly on the food-plant. I commenced to search again on July 10th, but by this date the bulk of the larvæ had apparently emerged, for several hours' search only revealed five ova, all of which hatched during the next day or two.

The ova is of a pale straw-colour when deposited, gradually changing to deep orange in a few days, and shortly prior to emergence to dark leaden tint. It is upright, and of the usual *Colias* shape and character. The vertical and horizontal diameters are 1.25 millim. and .65 millim. respectively; it has a number of vertical ribs, the distance these are apart is about .05 millim.; numerous transverse ribs connect the vertical ones. The diameter of the apex of the ova is .15 millim. The micropylar area consists of a number of very shallow cells; it is not perceptibly depressed. The surface of the ova is highly glazed; that portion which from the position in which it is held reflects the light is tinged with mother-of-pearl.

This stage appears to last about twelve days, for one ova I had continuously under observation was, when found on June

28rd, of a pale straw-colour, and had evidently only just been deposited ; the larva emerged on July 5th.

The newly emerged larva is barely a millimetre in length ; it is of brownish green colour, with head black and shining. It is covered with tubercles, each tubercle emitting a white spine. I at once placed it upon a leaf of *Astragalus*, on which it commenced to feed, forming a small semicircular notch on the edge, and then stretched itself out at full length on the upper surface of the midrib of the leaflet.

On July 6th the larva had fed during the preceding night, which, it must be remembered, was as light as at noon ; it remained during the day stretched out as before.

On July 7th the larva had not fed or moved, but after this day, until July 12th, it fed slowly, eating round holes in the leaflet, always from the upper side ; when moved to change the food, which had to be done daily, the larva invariably stretched itself on the upper side of the midrib of a leaflet. From July 12th to the 16th it remained quiescent ; on the latter day the change into the second instar occurred. It was during this stage of practically the same appearance as during the previous instar, except that on the 16th its length had increased to 2 millim.

From July 18th to 28th I was travelling to England, and could thus only imperfectly observe the progress. By the time I had reached Christiania, on July 24th, the plants of *Astragalus* I had brought from Abisko were yellow and unfit for food. I was therefore forced to attempt to discover a substitute. The only leguminous plant I could find was the common white clover, *Trifolium repens*, which fortunately the larva took to quite naturally, and upon which it fed freely thereafter.

On July 31st the larva changed into the third instar. On August 2nd it was 5 millim. long ; the head was light yellowish green, thickly studded with tubercles, each of which emitted a black spine ; the remainder of the segments were dull green, with faint darker dorsal and subdorsal lines and light spiracular stripes. The whole of this area was thickly covered with white tubercles, each emitting a short spine. The ventral area was of the same tone of green as the dorsal. During this stage the larva fed chiefly on the upper epidermis of the clover-leaves, and hung by a thread when shook off.

On August 5th it ceased feeding, and prepared to change into the next stage. On the morning of August 6th I found it had changed during the night into the fourth instar. It was then 6 millim. long, of a decidedly darker colour than in the preceding instars, with the dark dorsal line not so apparent ; the subdorsal lines were now light coloured, almost as light as the spiracular line, which itself was much lighter than in the preceding stages ; the head was light green, as in the last stage ;

both head and general area were thickly covered with tubercles and spines, the tubercles in the general area being white in colour. The dorsal area between the subdorsal stripes was slightly narrower towards the head, and considerably more so towards the anus. The light spiracular line was narrow.

In this stage the larva ate the whole of the clover-leaf away, leaving the midrib only. On August 11th it ceased feeding preparatory for the next change; it was then 13 millim. in length, and stout for its length. The spiracular line was now much more prominent, white, and tinged towards the anal extremity with orange; the spiracles were brown, the subdorsal lines cream-colour; the general area green, of the colour of a clover-leaf; the head was lighter and duller green, the spines on it were black.

The larva changed into the fifth and last instar on August 12th; immediately this occurred it was 13 millim. in length; the head was now of the same green colour as the clover-leaves; the remainder of the segments were very dark moss-green, with the white spiracular and light yellow subdorsal stripes showing much more prominently than in the previous stages; it was thickly covered with white tubercles emitting black spines. The spiracles were now light crimson, especially those nearest the anal extremity. During this stage the subdorsal stripes were red on the upper sides, except for a few segments next the head, on which they were yellow; these tints were caused by the tubercles in the upper portion of the stripes being red or yellow respectively. The spiracular stripe was tinged with light crimson on the lower border from end to end; neither subdorsal or spiracular stripes extended through the anal segment; the spiracles were brown.

In this stage the larva grew with great rapidity, and on August 15th it had increased in length to 23 millim.; the width was then 4 millim. The colour was still moss-green, but of not so dark a tint as when last described. The subdorsal stripes were now red on the upper borders for the whole length.

On August 17th the larva had attained a length of 26 millim., and was then apparently full-grown. On this day it ceased to feed, and remained stretched out at full length upon its food, evidently being prepared to hibernate, had its natural conditions been obtained. Unfortunately, I could not manage to bury it for the succeeding nine months under several feet of snow, and keep the surrounding temperature many degrees below freezing-point. The best I could do was to place it on a piece of muslin in an airy cage and keep this in a cool cellar. Under these conditions the larva remained quite quiescent, and gradually decreased in size, until at the end of September it was only 13 millim. in length.

On December 18th it was apparently healthy, and had not

decreased further in size, but by December 25th, when my next inspection took place, it was dead.

The only other larva that reached the hybernating stage was similar in all respects to the one above described, except that it was entirely devoid of the light yellow subdorsal stripes; in place of these in all stages it had the dark subdorsal lines that characterized the third instar of the first larva.

From the above observations it appears evident that the larva of this species hibernates as a full-fed larva. Assuming that it must hibernate as a larva at all—and all the *Colias* species I am acquainted with do pass the winter in this stage—then the reason is evident, for the whole of its habitat is covered with snow several feet deep from September until May, and the winter frosts are so intense that every herbaceous plant is cut down and killed to the ground; therefore, on the snow melting in the spring, there would be nothing for the larva to feed upon.

It has been stated in a German magazine that the food-plant of *Colias* var. *werdandi* is *Oxytropis lapponica*. This is certainly an error, for two extremely competent Swedish botanists who were at Abisko in July last not only identified it as *Astragalus alpinus*, but informed me that *O. lapponica* is not found in Swedish Lapland, nor is it mentioned in the 'Flora Lapponica' of Linné. *A. alpinus* is an exceedingly abundant plant at Abisko, and is the only leguminous plant I saw there.

It must be borne in mind that the Province of Tornea Lappmark, which appears to be the chief habitat of *Colias* var. *werdandi*, is practically without cultivation, anything in the nature of a meadow being unknown, except perhaps in the vicinity of the few small towns or villages, everything elsewhere being entirely mountain, moor, swamp, or forest, and from all these the leguminous plants of cultivation are entirely absent. In the 'Flora Lapponica' of Linné only nine species of this order are mentioned.

The above observations on the life-history of this species throw some light on a problem on which there has been considerable speculation amongst lepidopterists, *i. e.* how do the larvæ find time to complete all their stages during the very short Arctic summer? It has been suggested as a way out of the difficulty that many, if not all, of them may feed for two seasons. My observations on *Colias* var. *werdandi* seem to show, however, that some, if not the bulk, of the species feed rapidly whilst they have a chance, and pass the winter as full-fed larvæ or as pupæ. I hope, however, to throw further light on this question at a future date.

Youlgreave, South Croydon: February 10th, 1912.

NEW FOREST NOTES, 1911.

By G. T. LYLE.

In spite of there being some people who, after a visit lasting a week or so, return to their homes saying that the Forest is "played out," that insects are exterminated, &c., &c., it remains a fact that, year after year, entomologists and collectors flock to this favoured neighbourhood, and, if they "know the ropes," generally leave well satisfied with the results of their labours.

The locality is so well known to many of your readers that, possibly, a few notes by a resident may be of interest.

As regards the oft-repeated statement that many of our insects, once common, have disappeared, I can think of three only of which this may be true; these are *Aporia cratagi*, *Leucophasia sinapis*, and *Melanargia galatea*. The first of these can scarcely be considered properly indigenous to this country, although, undoubtedly, it often breeds here. It seems probable that some time in the last century migratory specimens reached the Forest from the Continent, and, under specially favourable climatic conditions, succeeded in establishing a colony, but that the first exceptionally cold, or more probably exceptionally wet, winter killed off the settlers.

Why *L. sinapis* should have disappeared is a mystery. We can scarcely blame the collector; more probably hymenopterous parasites were the culprits. It would seem that some thirty years have elapsed since a specimen was captured; but it may turn up again. Who knows? Stranger things have happened.

If we cannot understand the disappearance of *L. sinapis*, it is equally hard to understand why *M. galatea* should ever have occurred in the Forest; a more unlikely spot for this chalk hill-loving species would be hard to find.

As in other parts of England, mackintoshes and umbrellas were at a discount during the summer of 1911, for, with the exception of Coronation Week, scarcely any rain fell from mid-April to mid-October. Such a very warm and dry summer accounts, no doubt, for so many insects having produced an additional brood, or partial brood. The following instances have come to my notice:—

Pararge egeria.—There appear to have been four emergences, the last in late September and early October.

Porthesia similis.—I took a fresh male from a street-lamp on the evening of October 19th.

Cerura furcula.—This species would seem to be frequently double-brooded, or partially so, in the Forest, but this has never been more noticeable than in 1911, for during September the larvæ could be taken in numbers from sallow.

Triphæna pronuba.—Two fresh female specimens were taken

at ivy-bloom on October 19th; one of these laid some four hundred ova on October 28th, which all hatched on November 29th.

Agrotis puta.—On October 21st I took a specimen at ivy, in very good condition.

Phyrus (Deilephila) livornica.—The capture of a very fresh specimen on August 28th has already been recorded (Entom. vol. xlv. p. 365).

The following emergences occurred in captivity. In no case were the larvæ forced in any way.

Nemeobius lucina.—Three bred in late July; ova obtained in May.

Mamestra contigua.—A single specimen emerged early in September, one of a brood of seven reared from ova laid in June.

Hygrochroa syringaria.—As was to be expected, this species produced a second brood in captivity.

Ephyra annulata.—On October 10th a single specimen emerged.

Semiothisa alternata.—Several bred in August.

Acidalia straminata.—A second brood emerged at the end of August.

Bapta temerata.—Several bred in early August from wild larvæ taken a month previously. I think this must have had a partial second brood in a wild state, as I beat a larva on September 3rd.

The records of a second emergence of *Limenitis sibylla* (Entom. vol. xlv. pp. 363 and 328) particularly interested me, as I had been keeping careful watch for a second brood in the Forest. We were not favoured, however. Two or three larvæ found in September were no larger than is usual at that time of the year.

On September 4th I beat from oak a half-grown larva of *Nola strigula*, from which I certainly expected to obtain an autumn imago. Unfortunately, although it fed in captivity for some three weeks, it did not appear to increase in size, and eventually died. I have never before taken a larva of this species in the autumn; when beaten in early May they are usually almost microscopic.

In October and November larvæ of *Noctua brunnea*, *Triphæna fimbria*, *Aplecta (Mamestra) nebulosa*, *Metrocampa (Eudalimia) margaritaria*, *Boarmia repandata*, and several others, were noticed to have attained a very considerably larger size than is usual in the autumn. Several of these overgrown larvæ of *M. (E.) margaritaria* were kept, and produced in every case one or more parasites. The parasites have not yet emerged from their cocoons, but judging from these they are a species of *Apanteles*.

During the whole year the prevalence of parasites was quite

a feature. Of twenty-five larvæ of *Agrotis strigula*, picked up one wet night in March, twenty-three produced a specimen each of the Braconid *Meteorus pulchricornis*, while quite fifty per cent. of the larvæ of *Hygrochroa syringaria*, taken in April and May, succumbed to the attacks of another Meteorid—a black insect with yellow legs, which appears to be nondescript.

Although I cannot hear of any great rarities having been taken at sallow, the number of beautiful forms of *Taniocampa munda* that were captured amply repaid the collector, to say nothing of hibernated *Lithophane socia*, which were rather abundant. Sugaring in June and July was quite a failure. This was no doubt owing to the prevalence of honeydew, and to there not being sufficient rain to wash it off the leaves. In August, however, *Catocala sponsa* and *C. promissa* turned up in fair numbers, and in the autumn the usual things were plentiful, although *Lithophane socia* was scarcely seen. We were glad to welcome back *Eumichtis protea* after an absence of several years.

It is my opinion that *Apatura iris* was more common in 1911 than it has been for a long time. I have heard of twenty-seven specimens having been captured in the neighbourhood of Brockenhurst alone. The larvæ were correspondingly plentiful in the autumn, and probably quite a hundred were taken locally.

It is very pleasant to find that, in spite of the hordes of collectors who yearly thrash our sallow bushes for the larvæ, this fine butterfly is still holding its own. Perhaps it would be an exaggeration to describe 1911 as a "butterfly year," but in addition to *Apatura iris* several species were more than usually abundant, the most noticeable being *Pararge egeria*, *Argynnis paphia* and its var. *valesina*, *Zephyrus betulæ*, *Cyaniris argiolus*, and *Chrysophanus phleas*.

As there still seems to be some little doubt as to the winter quarters chosen by *Gonepteryx rhamni*, it may be of interest to note that, on the evening of November 14th, when collecting with Mr. E. Morris (whom I must thank for much information which is embodied in this article), a specimen of this butterfly was discovered resting under an ivy-leaf some ten feet from the ground.* The insect was still in the same position on the night of November 28th, and was very easily seen by the light of an acetylene lamp, the wings appearing to reflect the light and to make the butterfly stand out very plainly. Finding it in the daytime, however, was a very difficult matter, so great was its resemblance in colour and shape to its surroundings.

On November 28th Mr. C. W. Colthrup discovered, while in my company, another hibernating *G. rhamni* in a similar posi-

* On February 14th this butterfly was still in the position noted, but on March 4th it had disappeared.—G. T. L., March 24th, 1912.

tion, but in this instance the insect was not more than three feet above the ground.

During the early spring *Hybernia leucophæaria* appeared in great numbers, and larvæ of *Boarmia repandata* were particularly plentiful at night. In the late spring many species of oak-feeding larvæ were not nearly so numerous as usual. This was again noticeable in the summer and autumn, when the larvæ of such species as *Stauropus fagi*, *Acronycta alni*, *Cochlidion* (*Heterogenea*) *limacodes*, and *Heterogenea asella*, were almost entirely absent. Luckily, larvæ of *Boarmia roboraria* and *Hylophila bicolorana* were plentiful. Referring to the larvæ of the latter species, it is, of course, well known that when hatched, and for some time afterwards, the young larvæ are green, and that they change to a brown colour before hibernation, so as to harmonize with their winter surroundings. It is generally imagined that this change of colour takes place at the last autumnal ecdysis, but I now find that it is not so, for the larvæ are quite as green after changing their skins as before. Very gradually the caterpillars cease feeding, become lethargic, and their green colour slowly fades, until they present a very washed-out appearance; then the brown pigment is "turned on," and the winter coloration assumed. The same thing may be noticed, though in a much less degree, with the larvæ of *Apatura iris*.

Although oak-beating in September was poor, birch and sallow yielded good results, larvæ of *Drepana falcataria*, *D. lacertinaria*, *Notodonta dromedarius*, *Ephyra pendularia*, *N. ziczac*, and *Cerura furcula* being abundant.

At the very spot where my friend, Mr. Bernard Piffard, took *Zygæna meliloti* some fifty-two or fifty-three years ago, I found, on May 28th, a dozen or more full-fed larvæ of this very local Burnet. The cocoons are difficult to see, for, unlike those of its near relative, *Z. filipendulæ*, they are placed low down in the herbage, the two or three that I have discovered having been attached to broad, flat, dead blades of grass. This spot, thirty yards square, seems to be the metropolis of the species, although it would appear that at various times colonists have been sent out or wandered away, and have for a time established themselves elsewhere in the neighbourhood. At any rate, it is the only place where *Z. meliloti* may be regularly expected to turn up.

Rumour has it that, some few years ago, a certain professional collector transplanted our Burnet to other parts of the Forest. If this be so, I am unaware as to the amount of success that attended the experiment. It may, perhaps, be well to record it, in case some wandering entomologist stumbles across these "private" colonies.

Regarding insects of other orders, I fear I have little to record, but it may be worth mentioning that the pine sawfly (*Lophyrus pini*) produced an additional brood. This insect

would seem to be generally double-brooded here, the first brood appearing in April and May, and the second in July and August. The larvæ resulting from the second brood, as a rule, remain in their cocoons until the following spring, when they pupate some fortnight or so before the imagines emerge. During last October, however, numbers of the imagines of both sexes might be beaten from *Pinus sylvestris*, even up to the end of the month.

In August Mr. W. J. Lucas was fortunate enough to capture several male and female specimens of the rare dragonfly, *Symptetrum fonscolombii*.

That weird-looking "beastie," *Centrotus cornutus*, turned up in greater numbers than I have ever known before, *Cixius pilosus* being also very common. The Typhlocybæ were not nearly so abundant as in 1910. Undoubtedly, the insects that were more noticed than any others in 1911 were the common wasps, *Vespa vulgaris* and *V. germanica*, which literally swarmed. A worker was observed on the wing as late as November 19th, while a queen, which had flown into a neighbouring cottage, was brought to me on December 30th. This abundance seems rather remarkable, as 1910 was particularly noticeable for the scarcity of wasps here, as in other places.

Brockenhurst: January 30th, 1912.

NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

Agrotis arenosa, sp. n.

Fore wings pale ochreous brown mottled with darker ochreous; antemedial line dusky, irregular, and indistinct; postmedial line indicated by brown dots on the veins, preceded and followed by dusky marks between the veins; blackish dots between the veins on termen; a dark brown quadrate spot representing the reniform stigma; fringes pale, traversed by a darker line. Hind wings fuscous, glossy, fringes pale. Under side whitish, ochreous tinged, discal area of fore wings suffused with blackish; all the wings have a black discal dot and a dusky, curved, postmedial line.

Expanse, 36 millim.

Collection number, 945.

A male specimen from Arizan (7500 ft.), September 11th, 1906.

Near *A. rubicilia*, Moore.

Epilecta flavilinea, sp. n.

Fore wings dark brown, thickly powdered with grey on basal and costal areas; antemedial and postmedial lines yellow, edged on each side with black, the former outwardly oblique and the latter almost parallel with termen; space between postmedial and the ochreous

subterminal line rather darker brown; area beyond the subterminal line slightly tinged with reddish; black marks towards base of the wing, on the costa, and on each side of the orbicular; a short black dash from inner edge of subterminal line near costa. Hind wings yellow, termen bordered with blackish except towards tornus. Under surface of fore wings blackish, costa and terminal area yellow flecked with blackish; hind wings as above.

Expanse, ♂ 36 millim., ♀ 40 millim.

Collection number, 1685.

One example of each sex from Arizan (7500 ft.), September, 1908.

Allied to *E. accipiter*, Feld.

Hermonassa inconstans, sp. n

♂. Fore wings ochreous brown, lightly freckled with brownish, outer third brown; subbasal line double, blackish, not continued to dorsum; antemedial line double, blackish, indented below costa; postmedial line double, blackish, wavy, curved beyond cell, indented below costa and above dorsum; subterminal line blackish, wavy; terminal dots black; reniform, orbicular, and claviform black, outlined in ochreous, reniform enclosing an ochreous line. Hind wings fuscous brown. Under side whitish suffused with fuscous, especially on fore wings; all the wings have blackish discal mark and postmedial line, the latter on hind wings indistinct towards dorsum.

Expanse, 28-32 millim.

Collection number, 946.

Two male specimens from Arizan (7500 ft.); one, the type, taken August 8th, 1908; the other captured September 21st, 1906. In the latter specimen the outer third of fore wings is concolorous with the rest of the wing, and the subterminal line is more distinct.

Allied to *H. incisa*, Moore, from Sikkim.

Hermonassa sinuosa, sp. n.

♂. Fore wings whitish, faintly suffused with pale brown, basal third greyish; basal line black, interrupted at median nervure, not continued to dorsum; antemedial line blackish, sinuous, followed by a black spot on the costa and a black sinus about middle; postmedial line blackish, wavy, excurved below costa, incurved above dorsum, preceded by a black spot on costa; subterminal line blackish, indistinct, originating in a large black spot on costa; reniform and orbicular paler than ground colour, outlined and centred with brownish. Hind wings fuscous, slightly paler towards base; a blackish discal dot and indications of a dusky postmedial line beyond. Fringes of the ground colour traversed by a pinkish brown line. Under side pale fuscous, brownish on costal area of hind wings; rather glossy; markings on fore wings indistinct; hind wings have a black discal mark and black postmedial line; the latter is sinuous and diffuse towards the dorsum.

♀. Similar to the male, but in addition to the other markings it has a blackish central line, which is bidentate towards costa.

Expanse, 30 millim.

Collection number, 1748.

One example of each sex from Rantaizan, May, 1906.

Allied to *Hermonassa* (*Graphiphora*) *pallidula*, Leech, from Western China.

Cirphis taiwana, sp. n.

♀. Fore wings pale ochreous brown, clouded and striated with roddish brown on the discal area; costa dotted with blackish; orbicular stigma brown, reniform blackish, both pale outlined, a whitish L-mark at lower end of reniform, and blackish diffuse spot beyond it; antemedial line blackish, with black dots upon it, outwardly oblique to just below vein two, thence inwardly oblique and indistinct to dorsum; postmedial line formed of black dots, which are connected by a wavy blackish line towards costa, almost parallel with termen, but the spot between veins one and two elongate placed inwards, and out of line with the others; fringes checkered with brown, preceded by black dots on termen. Hind wings dark fuscous, fringes pale ochreous brown; discoidal mark blackish. Under side pale ochreous brown, clouded with blackish on discal area of fore wings; all the wings have black discoidal spot and postmedial line, and black dots on termen.

Expanse, 42 millim.

Collection number, 146 a.

Two female specimens from Rantaizan.

Near *C. gentiosigma*, Hampson, from Ceylon; also *C. dharma*, Moore, from Sikkim.

Daseochaeta pulchra, sp. n.

♂. Fore wings green, longitudinally streaked with brown at the base and beyond middle of the wing, basal and antemedial lines black, both interrupted below costa, the latter expanded on dorsal area, and outwardly edged with white; postmedial line black, interrupted below costa and again by the lower brown streak, edged with white towards dorsum; subterminal line whitish sinuous, inwardly edged with blackish; costa dotted with black, a black mark between the stigmata, and two smaller ones below; fringes green checkered with darker, black dots at their base and tips. Hind wings pale fuscous, discoidal mark and postmedial line dusky; fringes pale greenish. Under side pale greenish; basal three-fourths of fore wings suffused with blackish; a blackish spot on middle of costa and a blackish clouded postmedial line on all the wings; a black dot in the cell, and a larger one at end of cell of hind wings.

Expanse, 32 millim.

Collection number, 924.

A male specimen from Arizan, September 25th, 1906.

Near *D. discibrunnea*, Moore.

Perigea albigutta, sp. n.

♀. Fore wings dark chocolate-brown, costa dotted with white; antemedial and postmedial lines indicated by white points, the latter irregular, double; subterminal line represented by white dots, three above the middle and one near dorsum larger than the others; a series of white dots on termen; reniform and orbicular stigmata represented by clusters of white dots; fringes marked with white at ends of the veins. Hind wings fuscous, inclining to black on outer area. Under side whitish, freckled and suffused with fuscous; blackish discoidal mark and postmedial line on all the wings, outer fourth blackish, traversed by a pale subterminal line on fore wings.

Expanse, 39 millim.

Collection number, 942.

A female specimen from Kanshirei (1000 ft.), July 28th, 1906.

Near *P. stellata*, Moore.

BUTTERFLIES AT DIGNE.

BY GERARD H. GURNEY, F.E.S.

(Concluded from p. 97.)

Melitæa aurinia var. *provincialis*.—*M. phæbe*. Not very common; those I took all tended to var. *cinxioides*.—*M. didyma*.—*M. cinxia*. A fresh brood began to appear about July 20th.—*M. deione*. A very few worn ones were noted.—*M. parthenie*. I took a magnificent aberration of this species on July 18th; in Oberthur's 'Lépidoptérologie Comparée,' it is figured as ab. *rhoio*, on the upper side there are no black markings on the fore wings at all, except the outer margin and a suffused patch at the base. On the lower wings all orange colouring is absent, leaving the wings entirely brown: the under sides of the hind wings are pure white, except a greenish brown patch at the base containing a large black discoidal spot.—*M. athalia*.

Pyrameis cardui.—*P. atalanta*.—*Euvanessa antiopa*. Only one or two seen.—*Vanessa io*.—*Aglais urticae*.—*Eugonia polychloros*.—*Polygonia egea*. Scarce; not more than two or three seen.—*P. c-album*.

Limenitis camilla. Small males of a second brood were common.

Parage mæra.—*P. megera*.—*P. cyeria*.

Satyrus hermione. Very abundant, and in magnificent condition on July 18th; the females are very large.—*S. alcyone*. This species is perfectly distinct from *hermione* at Digne, being found at a higher level and always resting on the ground, never on trees; it is very constant in size, it also emerges later than *hermione*: on July 23rd, in places where *hermione* was beginning to get much worn, *alcyone* was quite fresh.—*S. circe*. Plentiful in orchards and hayfields, and quite fresh on July 18th; very large and fine, some of the females being enormous; many have a second spot on the fore wing.—*S. cordula*. Abundant everywhere, but beginning to go over by July 21st. The females show considerable variation in the colouring of the light band on the upper side of the hind wing; in some specimens it is very

light orange brown, in others there is hardly any trace of a band, the whole wing being a uniform dark brown; all the specimens are extremely dark compared with those from the Rhone Valley.—*S. actæa*. In beautifully fresh condition and very common in places, but not found everywhere round Digne; it did not emerge until July 22nd.

Ennodia dryas. I only took this species on one or two banks on the road to Les Dourbs; the females are very large.

Hipparchia statilinus. Just beginning to emerge as I left.—*H. fidia*. This fine species was common after July 19th, and amongst the series of twenty which I took are some magnificent specimens; it was very fond of settling on the white flowers of the wild clematis and was then much more easily captured than when sitting on rocks or on the road.—*H. briseis*. Emerging on July 18th, this species quickly became very common on dry, stony ground, though I appeared to take the great big females more often flying along the edges of hay-fields.—*H. semele*. Very common, but not an exceptionally fine form.—*H. arethusa* var. *dentata*. Males were common on August 1st, and all I took were of this variety. I was too early for the females.

Epinephle ianira.—*E. lycaon*. Very common everywhere; many of the males have a second spot towards the anal angle, upper side of the fore wing.—*E. tithonus*. Abundant; the females were large and brilliantly coloured.

Ctenonympha arcania. I found a few fresh ones, presumably of a second brood, considerably smaller than those I had previously taken at Digne in June.—*C. dorus*. Extremely abundant everywhere, quite fresh and showing a good deal of variation.—*C. pamphilus*.

Erebia melampus. By no means uncommon high up on the Dourbs on July 31st, but a good deal worn.—*E. stygne*. Near Digne and also on the Dourbs.—*E. scipio*. I found *scipio* quite common on the one slope on which this species flies on the Dourbs on July 31st, but on this date no females were seen, they were all males and generally quite fresh. In the hot sun they fly very swiftly up and down the flower-covered precipice, on which, owing to its steepness and the loose rolling stones, it is a very difficult matter to catch them; directly the sun becomes overcast they cease flying and drop down amongst the stones, often with outspread wings. I strongly suspect that if properly searched for this species would be found on other parts of the Dourbs. The series of twenty-two which I took show a good deal of variation in the number of spots on upper side of the hind wing; three appears to be the usual number, but I took specimens with two and one spot on each wing, and eight of my series have no spots whatever; on the upper wings the proportion of insects having two spots and four seems to be equally divided.—*E. ligea*. Rather plentiful in the beech forest half-way up the Dourbs.—*E. neoridas*. I saw the first on July 25th, and it was beginning to get very common when I left Digne on August 1st.—*E. goante*. Common in one place on the Dourbs, just above the slope on which I took *scipio*, they were quite fresh.—*E. tyndarus* var. *cassiodorus*. Flying with the last species, but rather more widely distributed. It was common and in good condition; all I took were of this variety.

Melanargia galathea.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S., &c.

MAY was mainly a fine bright month, and some of the days were very hot; there was scarcely any rain, except a few showers on the 2nd and 3rd, rather wet on the 14th, and a shower or two on the 30th. From the 18th to the 21st the weather was very dull, with keen north-easterly wind. There was a good deal of wind during the month. On the 1st *Catoptria ulicetana* was noticed flying about furze-bushes, in the hot sunshine, in great numbers; and at night some larvæ of *Triphæna orbona*, *T. ianthina*, *Noctua triangulum* and *Boarmia repandata*, were beaten from hawthorn—mostly full grown. The first *P. napi* was noticed on the 3rd, and a beautiful red variety of *Tæniocampa gracilis* was bred from New Forest larvæ. On the 4th a boy brought me a male *Dicranura vinula*, which had been attracted by the electric lights at Parkeston, and in the evening I visited the woods and beat some larvæ of *T. fimbria*, *N. baja*, &c.; it was a warm night with gentle south-westerly breeze, but I did not see a moth on the wing. The first *Pieris brassicæ* was observed on the 5th, two *Cyaniris argiolus* were taken, and *Asthenes luteata* bred. On the 8th *Amphidasys betularia* ab. *doubledayaria* was reared from the only larva taken last year, and *Fumea radiella*, male, was captured flying among coarse grass on the sea-bank. The 9th was gloriously bright and warm, and in the evening I tried beating hedges near the salterns and obtained a few larvæ of *Lasiocampa quercus*, *T. interjecta*, *N. augur*, *Crocallis elinguaris*, &c. It was a windy night, with a bright moon and heavy dew, and the only moths noticed were a few *E. pumilata* and one *Xanthorrhæ fluctuata*. *Euchloë cardamines* was bred on the 10th, and on this day I saw the first swifts. Four *Eupithecia dodoneata* were taken on trunks of *Ilex*, and one *Lycia hirtaria* (which is a rare moth in this neighbourhood) from a paling. On the 12th, a bright morning, I took a female *S. carpini*, bred on the 11th, placed her on a hedge in a likely-looking spot, and waited for nearly two hours, but no male was attracted—perhaps they were not yet out. The 13th was fine and hot, with thunder-clouds about, and distant thunder. I went to the woods in the forenoon; *A. cardamines* was just appearing, there were plenty of *P. rapæ* and *P. napi*, and from the bushes I beat *Numeria pulcheraria*, *I. petrarica*, *V. maculata*, *C. ferrugata*, *C. unidentaria*, *Phloxopteryx lundana* and *P. lætana*, and one small larva of *Limenitis sibylla* was noticed. Before I left home in the morning I placed the *S. carpini* female, bred on the 11th, in a box with lid slightly open, in my garden, and when I returned at 1 p.m.

she was still resting quietly, but at 2.30 I noticed she was "calling." I then went out for a couple of hours, and when I returned at 4.30 found her wedded to a very fine male; at 5.15 the pairing was over, and I killed the male. At 7.30 I found the female had laid a large number of eggs. On the 15th several larvæ of *Pseudoterpna pruinata* (*cytisaria*), nearly full-grown, was beaten from broom, and plenty of larvæ of *Chesias spartiata* were seen. In the evening, which was warm and muggy, *Perizoma affinitata* was netted, and four larvæ of *T. interjecta* were picked off nettles. A large female *Smerinthus populi* was noticed, just emerged, on a poplar in the garden. 16th. Many *N. pulveraria* bred about this time. The 17th was fine and bright, with a keen north-easterly breeze, and I went to the distant woods, where I found *Argynnis euphrosyne* just coming out, and captured and examined sixteen of them, hoping for varieties, but they were all typical, fifteen males and one female. One *Nemeobius lucina* was seen; this is getting very scarce, and I fear will soon cease to exist in this locality. Beating was very unproductive; I think the cold wind kept the insects from moving. I only saw one *Lomaspilis marginata*, one *Acidalia remutata*, and three *Lobophora hexapterata*; the latter were sitting on tree-trunks near aspens; they are very crafty, and often dodge behind the trees when one tries to box or net them. The 18th was cool and overcast, with a north-easterly wind. I tried sweeping nettles, &c., after dark, and obtained nine larvæ of *T. interjecta* and several *Leucania lilhargyria*, &c.; half-grown larvæ of *Cosmotriche potatoia* were numerous, and full-grown *Hypena proboscidalis* abundant. The 22nd being bright and warm, I went to the woods to beat for larvæ, but found them very scarce indeed, and only saw a few each of *P. pilosaria*, *H. defoliaria*, &c., species which ought to have been swarming now. On honeysuckle I noticed half a dozen larvæ of *L. sibylla* and two of *P. syringaria*. *Pararge megara* was seen for the first time. This butterfly had almost disappeared from this neighbourhood, but last autumn I turned down about sixty, which I bred from ova received from the South of Ireland. The 23rd was fine and warm—*C. pamphilus* was out in large numbers, and *H. arbuti* and *A. ochrearia* were flying over rough ground among rushes and mouse-ear. The 24th was another warm day, and in the evening I sugared in the woods; it was (apparently) a very favourable night, but only two moths visited the bait: one *Palimpsestis or*, and one hibernated *Scoliopteryx libatrix*. Geometræ and Tortrices were flying in some numbers just before sunset, but the flight did not last, as a slight dew and cool north-westerly wind appeared to send them into shelter.

(To be continued.)

NOTES AND OBSERVATIONS.

DEPRESSARIA PUTRIDELLA IN THE HARWICH DISTRICT. — Many years ago I used to notice towards the end of May and beginning of June that the young plants of the very local hog's-fennel (*Peucedanum officinale*), which is not uncommon in certain localities in this neighbourhood, were infested by the larvæ of some species of *Depressaria*, but, not being very keen about the Tineinæ, I did not pay much attention to them, though I know it now and then occurred to me that, as the plant was so local the chances were that these larvæ might also be something of a rarity; and so the years rolled on until 1909, when Mr. Sich's record of the discovery of *D. putridella* in Kent made me think that the larvæ I had noticed so often on hog's-fennel and treated of so little account might probably be that species; and so the next year (1910), the larvæ being as plentiful as usual, I took some of them with their food-plant, and placed it in a wide-mouthed bottle in a large flower-pot, with muslin hood over, and in a few weeks bred a couple of dozen *D. putridella*.—GERVASE F. MATHEW; Dovercourt, March 8th, 1912.

CÆNONYMPHA TYPHON. — I shall be very much obliged if any collector can furnish me with two pairs of Irish *Cænonympha typhon* in first-rate condition. They are required for figuring in a future number of M. C. Oberthür's 'Lépidoptérologie Comparée,' to which I am contributing a short account of the British and Irish forms. Also wanted "furthest north" Scots forms. I shall be pleased to exchange.—H. ROWLAND-BROWN; Harrow Weald.

EARLY EMERGENCES. — *Phigalia pedaria* (*pilosaria*) on lamps in suburbs, January 1st, 2nd, and 5th. *A. flavicornis* on palings at Sutton Park, March 1st, and *H. progemmaria* (type and melanic), March 5th. Out of three hundred bred pupæ of *Odontopera bidentata*, although kept in cold room till January 1st, and since then out of doors, forty-three (type and black forms) have emerged up to date. The first one emerged December 22nd, eighteen in January, nineteen in February. Thermometer in breeding-cage, 33° F. at moment of emergence of several. Three pairings have been obtained, and ova deposited.—W. BOWATER; Russell Road, Moseley, Birmingham, March 11th, 1912.

NYSSIA HISPIDARIA IN NORFOLK. — I captured, on Wednesday, February 14th, in Northrepps Woods, near Cromer, one male *Nyssia hispidaria* resting on an oak-trunk by day.—A. C. MORRIS; Roughton Rectory, Norwich, February 23rd, 1912.

HESPERIA ONOPORDI IN THE PYRENEES. — While staying at Gavarnie last July I took a fine series of *H. alveus*, which was very common there. A short time ago, when taking the specimens off the setting-boards, I found among them three *H. onopordi*, all males, and in perfect condition. Two were captured in the Val d'Ossue, one on July 16th, the other on the 20th, the third coming from the Val d'Astazou on the 14th. Mr. Rowland-Brown informs me that

M. Rondou, of Gédre, has recorded Gar du Pau as the only locality in the Pyrenees for *H. onopordi* so far. Gavarnie is, of course, very much higher.—B. C. S. WARREN; Innis, Claygate, March 21st, 1912.

NOTE ON *APOROPHYLA NIGRA*.—Tutt's 'Lepidopterist's Handbook' gives ova of *Aporophyla nigra* as hatching six weeks after deposition (*i. e.* end of October), and elsewhere I have seen the larval period described as extending from October to May. That such is not always the case I am in a position to prove. Two batches of ova were obtained from female *A. nigra*, taken on sugar about the middle of September last year. The egg when laid was a uniform orange-yellow. At the time they ought (?) to have hatched, the apical half was marbled with a mixture of reddish and whitish, the basal half still keeping the original tint. Later, about Christmas, the reddish marbling had extended over the whole surface of the egg. A fortnight ago I brought them indoors on account of the fungoid growth which had attacked the damp cardboard pill-box, and which I feared might eventually kill the ova. On examining them I found they had assumed the dark slaty tint of eggs about to hatch. Kept in a cold upstairs room, they began to hatch on February 14th, and had all left the egg by the 17th. The greyish, bristly young larvæ refused dock, plantain, dandelion, and a coarse-leaved grass which grows in their locality, and which I had suspected would prove to be their true food, but took readily the hair-grass (*Aira cæspitosa*), which also thrives on our upland limestone pastures. They are growing somewhat slowly, but seem quite healthy. Though now two weeks old, they have not lost their early "looping" habit, and when resting on the grass-stems they frequently assume a striking *Sphinx*-like attitude. The ground colour of the body is now a deep grass-green, and they have lost that bristly appearance which characterized the newly hatched larvæ.—FRANK LITTLEWOOD; 10, Aynam Road, Kendal.

PYRAMEIS ATALANTA IN EARLY SPRING.—Whether *P. atalanta* does or does not hibernate in this country I do not know, but it may be of interest to note that this morning (March 24th) I saw a specimen flying in a ride of Iron Hill Enclosure near here. I watched the insect for some ten minutes or so, and several times it settled on the fallen leaves within a yard or two of me. It was in good condition but perhaps rather faded. I may mention that I noticed a good many *P. atalanta* in the neighbourhood last autumn.—G. T. LYLE; Bank House, Brockenhurst.

THE ENTOMOLOGICAL CLUB.—Meetings were held on February 27th, 1912, at 58, Kensington Mansions, South Kensington, Mr. Horace St. John K. Donisthorpe in the chair; and on March 12th, 1912, at Wellfield, 4, Lingards Road, Lewisham, Mr. Robert Adkin in the chair. At the former meeting Mr. Alfred Sich was elected a Member of the Club, and Dr. Malcolm Burr an Honorary Member. At the latter meeting Mr. J. E. Collin was elected an Honorary Member of the Club.—RICHARD SOUTH, *Hon. Sec.*

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Annual General Meeting.*—*January 25th, 1912.*—Mr. W. J. Kaye, F.E.S., President, in the chair.—The Reports of the Council and Officers for the past year were received and adopted. The following is the list of Council and Officers elected for the ensuing year:—President: A. E. Tonge, F.E.S.; Vice-Presidents: W. J. Kaye, F.E.S., and B. H. Smith, B.A., F.E.S.; Treasurer: T. W. Hall, F.E.S.; Librarian: A. W. Dods; Curator: W. West (Greenwich); Hon. Secretaries: Stanley Edwards, F.L.S., F.Z.S., F.E.S., and H. J. Turner, F.E.S.; Council: C. W. Colthrup, F. W. Cowham, A. E. Gibbs, F.L.S., F.E.S., R. A. R. Priske, F.E.S., A. Russell, F.E.S., A. Sich, F.E.S., and E. Step, F.L.S.—Mr. W. J. Kaye read the Annual Address.—Votes of thanks were passed to the Treasurer, Secretaries, and other officers.—*Ordinary Meeting.*—Mr. A. E. Tonge, F.E.S., President, took the chair.—Mr. A. C. Morris, of Upper Norwood, and Mr. F. W. Frohawk, of Wallington, were elected members.—Mr. Edwards exhibited the so-called “silver fish,” *Lepisma saccharina*.—Mr. Main, a narcissus bulb, sent him by Mr. Winkworth, which had been attacked by the larva of the Dipteron, *Merodon equestris*, which was often extremely injurious in nurseries. Mr. Adkin, a *Tinea pallescentella* taken on Christmas Day, apparently just emerged.—Mr. Moore, a number of butterflies from the interior of Borneo, including *Papilio evemon* var. *P. itamputi*, *Terias gradiens*, *Hestia rogani* var. *virgo*, *Danisepe lowii*, and *Terias tilaha*. They were sent home to him packed in fragments of the flannel shirt of his friend who collected them, a successful method of combatting the excessive superabundance of moisture in the atmosphere of the locality.—HY. J. TURNER, *Hon. Report. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The fourth meeting of the session was held in the Royal Institution, Colquitt Street, Liverpool, on January 15th, 1912.—A large number of interesting lantern slides were exhibited by Dr. Cotton, Dr. Tinne, and Mr. O. Whittaker. Dr. Tinne's slides included many beautiful coloured examples taken by the Lumière and other colour processes.—Mr. Mansbridge exhibited a series of *Polia chi*, showing the usual range of melanic variation, from the Huddersfield district, and, also, on behalf of Mr. A. W. Boyd, a case of Micro-Lepidoptera from various localities in Cheshire, among them being *Mixodia schulziana*, *Sciaphila hybridana*, *Sophronia parenthesesella*, *Chelaria hubnerella*, *Argyresthia pygmaella*, *Peronea comariana*, &c.—OSCAR WHITTAKER and WM. MANSBRIDGE, *Hon. Secs.*

OBITUARY.

SAMUEL JAMES CAPPER, F.E.S., F.L.S., &c.

Mr. Capper, of Hazle View, Huyton Park, Huyton, whose death we announced in our February issue, was a son of Joseph and Mary

Capper (*née* Camthorne), members of the Society of Friends, and was born at Highbury Place, London, N., April 28th, 1825. The family pedigree dates as far back as 1590 to a William Capper, copyholder, who lived near Rugeley, Staffordshire, and who died February 2nd of that year. The earliest mention of the family becoming members of the Society of Friends is found in a record of the marriage of Jasper Capper to Anne, daughter of John Fry, on April 21st, 1778.

From early childhood Mr. Capper evinced keen interest in Natural History objects, and when about twelve years old he was sent to a school at Epping, where his taste for Nature Study was greatly encouraged and developed. On half-holidays the boys were taken to the Forest, and permitted to roam therein at their leisure until a bugle-call warned them to reassemble. Opportunity was thus afforded, to those so inclined, to collect specimens, or in other ways attain knowledge of the fauna and flora of the district.

Mr. Capper's interest was chiefly centred in the Lepidoptera, and he, with the help of one or two of his schoolmates, made a very fair collection of the moths and butterflies occurring in Epping Forest. He also received valuable help from the brothers Doubleday, who were always happy in rendering assistance to young entomologists, instructing them in the art of setting and preserving insects, and solving difficulties connected with the identification of captures.

In the year 1846 Mr. Capper settled in Liverpool, and soon made the acquaintance of Messrs. Nicholas and Benjamin Cooke, C. S. Gregson, N. Greening, and other leading entomologists of that district and period. About 1866 he became known to the late Mr. Alfred Owen, with whom he afterwards made collecting expeditions to various districts, including the New Forest and Penmaenmawr. In the latter he secured, among other species then considered rare, *Acidalia contiguaria** during July, 1874, but met with the unfortunate accident which resulted in his being permanently lame, and therefore unable to again engage in the pleasure of active field work.

His connection with the Lancashire and Cheshire Entomological Society has been a long one. The preliminary meeting was held at the residence of the late Mr. N. Cooke, at which Mr. Capper, who did not attend, was elected President, and this office he held for thirty-five years. The first official meeting seems to have been held at Huyton Park on March 26th, 1877.

Apart from the many excellent addresses to the members of the Society, over the meetings of which he so long and so ably presided, his published writings on entomological subjects are rather few in number. An article entitled "Educational Collections" (*Entom.* x. 40-42) bears evidence that, although chiefly interested in the Lepidoptera, all orders of the Insecta received a share of his attention.

For many years Mr. Capper was a partner in the firm of Thompson and Capper, manufacturing chemists, Liverpool, and, although he continued association with it, he had not taken an active part in the business during the past fifteen years or so.

* A Geometrid moth known under three English names—"Weaver's Wave," "Greening's Pug," and "Capper's *Acidalia*."

THE ENTOMOLOGIST

VOL. XLV.]

MAY, 1912.

[No. 588

BRITISH ODONATA IN 1911.

By W. J. LUCAS, B.A., F.E.S.

So abnormal a summer as that of 1911 could not fail to provide points of interest to those who concern themselves with British dragonflies. It may be that 1912 and 1913 will witness a scarcity of some species, owing to the drying up of their breeding-grounds, although it is quite possible that the race has already provided against such a contingency. It is to be hoped that observation in connection with this subject will be made by those who work amongst the Odonata, or those who, though not specially interested in these insects, are favourably situated for making such observations. It seems likely that one immediate result of the dry hot season was the migratory impulse that appeared to be at work amongst the dragonflies, which will be referred to later.

Personally, the first date on which a dragonfly came under my notice was May 7th, when one or two Agrionids were seen near Oxshott, Surrey. They were not captured, but no doubt were examples of *Pyrrhosoma nymphula*. On May 26th Mr. B. S. Williams sent me four specimens, two males and two females, of *Libellula depressa* (the males being without a trace of blue colouring), which he had captured at Finchley, where he had never seen the species before. Mr. H. W. Andrews showed me *L. quadrimaculata* and *P. nymphula*, taken during a visit to Glengarriff, co. Cork, from May 21st-26th. On May 28th Mr. N. Fenwick, Jun., found large numbers of *Cordulia aenea* out at the Black Pond, in Surrey. He took one male and three females, and could have caught many more. *L. quadrimaculata* was out in force, as also were *P. nymphula* and *Enallagma cyathigerum*, but he saw no other species. On June 4th dragonflies were very numerous at this pond, and, in addition to those already mentioned, a summer species, *Pyrrhosoma tenellum*, was on the wing. A nymph-skin (species undetermined) was on this occasion taken from the trunk of a Scotch fir some ten or twelve yards from the pond and more than six feet above the ground. The next day dragonflies were found to be plentiful at a small

pond between the River Wey and the large pond, Boldermere, facing the Hut Hotel, near Wisley, in Surrey. These were *L. quadrimaculata*, *P. nymphula*, and *Agrion puella*, while a larger one seen appeared to be *Brachytron pratense*.

Writing on June 16th, Mr. G. T. Porritt told me that on June 15th Dr. Corbett and himself visited the locality near Askern, in Yorkshire, where the former took *Libellula fulva* two years previously, and Mosley took it twenty or more years ago. They were delighted to find it in abundance, flying all about the place. Mr. Porritt had never seen it so plentiful, even in the Norfolk Broads. The males were in adult colouring, and there were plenty of females, which are usually scarcer in the Broads. Many were paired. Altogether it was very satisfactory to find the species thus well established in so northern a locality.

On July 2nd, near Oxshott and Claygate, in Surrey, dragonflies were not so much in evidence as they were on June 4th. One or two examples of *L. depressa* haunting a hedgerow were particularly agile, and after receiving a lengthy attention remained uncaptured, although, as usual, they were very loth to forsake their chosen resort.

During the first few days of August, Mr. K. J. Morton saw *Sympetrum striolatum*, *Lestes sponsa*, *Ischnura elegans*, and *Agrion pulchellum* at Llanfaethlu, in the Island of Anglesey.

In the New Forest during August dragonflies were plentiful enough, being apparently but little affected by the dry weather. It would seem that some species were over earlier than usual, for I did not meet with a single example of either *Ischnura pumilio* or *Agrion mercuriale*. On August 15th a nymph-skin of *Cordulegaster annulatus* was found some two or three feet up a tree-trunk several yards from the bank of Beaulieu River, in which of course it had passed the previous part of its existence. What object could the nymph have had in crawling so far? On August 27th Mr. Lyle and myself searched for nymph-skins under bridges at Queen's Bower, the lowness of the water allowing us to do so without difficulty. Under Bolderford Bridge we found three *C. annulatus*, two *Calopteryx virgo*, one *S. striolatum* (probably), and one *Platycnemis pennipes* (possibly). All had taken up a position beneath a horizontal beam, and so had their dorsal surface downwards. Under the bridge near Hurst Hill were one *C. annulatus* and one *C. virgo*, and these were similarly suspended. It is strange that all were so placed, especially as there was no actual necessity for it, since in my own experience this is an unusual or even unique position to assume for emergence.

On August 4th, at a rather large shallow pond in what is perhaps an old marl-pit on Beaulieu Heath, in the New Forest, some dragonflies with red bodies were on the wing. At first I took them for the common *S. striolatum*, till their manner of

flight and strikingly brilliant tint caught my attention. The former resembled that of *Sympetrum flaveolum* and *S. sanguineum* as I had been accustomed to it at Wisley Ponds, in Surrey. After considerable difficulty three were captured, and I found that I had added a new species to my British collection and at the same time to the New Forest list (*vide antea*, vol. xliv. p. 267). The species was in fact *S. fonscolombii*, which almost certainly is always a migrant to our shores. All were males, and another seen was apparently a male also. On August 7th I revisited the pond and found the species still present. At least one female which looked like a *Sympetrum* was seen, but it was not captured. As, however, I took a male *S. striolatum*, the female may have belonged to that species, or it may even have been an *Orthetrum*, as *O. cærulescens* was common at the spot.

On August 8th I made a third excursion to the pond, and this time secured a female *S. fonscolombii*. The fresh condition of the species and the capture of the female raised some doubt in my mind as to whether the dragonflies could be migrants after all, an opinion which Mr. C. A. Briggs shared with me, in consequence of the lateness of the date. When hovering on the wing in the brilliant sunshine their bodies glow with a rich soft scarlet tint, which unfortunately becomes dark and dull as they dry after death. The female, which was in perfect condition, looked very pale on the wing. On August 24th I again visited the spot, but it began to rain as soon as I arrived. The next day, however, I tried again, and found specimens numerous, but their restless habits and the rather high wind made it difficult to catch them. As *S. striolatum* was on the wing also, it was difficult to tell whether any females of *S. fonscolombii* were present; but one very pale specimen belonged, I think, to the scarcer species. Unfortunately I could not effect a capture. The insects were not so fresh now, but the crimson colouring was as rich as ever. On August 29th I visited the pond for the last time. Males still seemed fairly numerous, but they were as usual very restless, and I captured but one.

From the New Forest we must now turn our attention to Scotland. Mr. W. Evans tells us in the 'Scottish Naturalist' (No. 1, p. 12, January, 1912) of his capture of a female *S. fonscolombii* on August 17th in the Isle of May at the mouth of the Firth of Forth. He afterwards heard from Mr. P. H. Grimshaw that another female had been caught by a boy in Edinburgh on August 11th. Further, as he was examining a box of insects for Mr. J. W. Bowhill, he found amongst them a fine male of the same species which had been taken on July 30th near Aberlady, where others were seen at the same time.

Nor is this all. In the autumn Lieut.-Col. C. G. Nurse sent me some dragonflies for identification, and amongst them were two males of *S. fonscolombii*, one taken at Ampton, in West

Suffolk, on August 17th, and the other at Towyn, in Merionethshire, also in August, the latter by Rev. E. J. Nurse (one of two captured). In connection with the Welsh specimens it is worthy of note that on June 2nd a swarm of dragonflies was seen flying east near Aberdovey. The flight was noticed by several people at Towyn and Aberdovey, and it was so large as to be mentioned in one of the local papers. There is nothing, however, to show that the two Welsh specimens of *S. fonscolombii* belonged to this swarm. If those entomologists who took red-bodied *Sympetra* in Britain during last summer were to critically examine their captures, it is quite likely that other examples of *S. fonscolombii* might be discovered. It should also be mentioned that Mr. Watts took another dragonfly, which is usually considered a migrant (*S. flaveolum*, male), at Wisley Pond, Surrey, on August 18th; and that Mr. H. Champion took two more males at the same place a few days later.

Previous records of *S. fonscolombii* captured in Britain are: (1) a female in Stephen's collection supposed to have been taken near London; (2) a male captured in 1881 at Deal, now, I believe, in the Dover Museum; (3) seventeen males taken by Mr. C. A. Briggs at Ockham Common, Surrey, in June, 1892; (4) a female taken in Cornwall by Mr. Boyd in June, 1903; (5) two males taken June 24th, 1908, by Mr. E. R. Speyer near Shenley, Herts; (6) a female taken by Mr. Speyer at Aldenham Reservoir on July 29th, 1908. A male from the Devignes' collection, now in the McLachlan collection, has no indication of the locality whence it came, and therefore cannot with certainty be set down as British.

(To be concluded.)

EREBIA MANTO AND ITS VARIETIES ABOVE CHAMPÉRY.

By THE REV. F. E. LOWE, M.A., F.E.S.

DRAWN by reports which I had heard of Champéry, above Monthey, as a locality for many of the Erebias, I spent a few days there last year. We put up at the Hôtel Dent du Midi on July 26th, and remained until August 1st. This was of course late in the season and naturally butterflies were on the wane. The slopes of the Dent du Midi and of the Dent Blanche, though so near to the eye, are rather fatiguing to reach. As the river runs between, it is necessary to descend from Champéry to the bridge before beginning to make the ascent. I paid two visits to the little shanty of Anthémoz, whence I worked along the rough ground diagonally and upwards for about another two hundred feet. Here I was among the Erebias that I had

come after. *E. gorge*, *epiphron*, *pharte*, and *pronoe* var. *pitho* had probably been common, but were now represented by a few very worn specimens.

There remained, however, one species, *E. manto*, which was present in abundance, and for the most part in first-rate order, and this presented a range of variety sufficient to make interesting collecting. The males certainly were not always fit for the cabinet, but the females, which were nearly equally common, were generally in splendid condition, and it was in them that interest centred.

Here *manto* seems to offer itself in almost every variety, and the type-form was unusual. Var. or ab. *cæcilia* was taken occasionally, but always for some obscure reason too battered to afford specimens. Not uncommon, too, was a very small form, in size qualifying for ab. *pyrrhula*, Frey., but still retaining the eye-spots too distinctly, and too much trace of the russet surroundings, to quite justify the title. Very interesting, however, was a form (almost the commonest) which I can only consider to be var. *vogesiaca*, Christ, defined by Staudinger in his Catalogue, as females, *without the basal spots*, on under side of hind wings, but otherwise as type *manto*. This striking form both the above authority and Rühl seem to regard as restricted to the Vosges, and it was therefore a pleasant surprise; nor is it mentioned in Wheeler's 'Butterflies of Switzerland.' But this was by no means the extreme of variation presented by the *Anthémoz* race. Hardly less common was a female form *entirely* without markings on the *under side*. At first I thought that this was a hitherto unnoticed variety, and had distinguished it in my cabinet as ab. *indigena*, on my own responsibility. But on further examination of Staudinger's Catalogue I found in the first paragraph, under the type heading *manto*, "ab. female *trajanus*, Hormuz. Soc. Ent. ix. 1895, p. 161 (al post. subt. *basi immaculata*, *maculis exterior. fere æqualibus*).” I have not the opportunity of searching the pages of the 'Societas Entomologica' for a description of *trajanus* and comparing it with my specimens from Champéry, and can therefore only surmise that my captures fall under this form. Again, var. *vogesiaca*, as described more at length in Rühl, is stated to be larger than type, with the markings of the fore wings yellow and broader, and seldom containing the black spots. Mine, from the Champéry locality, are only of average size, with dull but rust-coloured small patches on the upper side of fore wings with fairly distinct eye-spots; and are therefore to be regarded as a separate variety, or a transition to var. *vogesiaca*.

In any case I had reason to be much pleased with the result of my visit to this locality, as it afforded two forms for Switzerland (new to me) after fifteen consecutive years' pursuit of butterflies in that land of *Erebias*. The only other butterflies of

interest were the extraordinary number of *Argiades corydon* and *Polyommatus damon* by the sides of the railway between Monthey and Champéry, the former exceptionally large. It was just above the little station of Trois Torrents that they appeared to fill the air, fluttering even into the carriage windows. From this their number gradually declined till after leaving the station of Champéry, both became decidedly scarce. Perhaps at the slightly higher altitude they had not yet fully emerged, and those taken were not large specimens.

St. Stephen's Vicarage, Guernsey.

NOTES ON *ANOSIA PLEXIPPUS*.

BY THE REV. JAMES AIKEN, M.A.

AN interesting article on *Anosia plexippus* (life-history) appears in your December number (Entom. xliv. pp. 377-382) from the pen of Mr. Frohawk. The following extracts from my note-book may be of interest in so far as the observations were made on the insect in its own natural conditions.

In British Guiana the food-plant is *Asclepias currassavica* exclusively, so far as I have observed. This butterfly invariably lays its eggs singly on the under side of the leaf. Alighting on the apical quarter it arches the abdomen under the leaf and deposits the egg generally about the middle, then flits away in search of another plant. The egg matures in two to three days, and the larva grows rapidly. Some eggs which I took on March 18th hatched out the same day. On March 24th the caterpillars were about $1\frac{1}{2}$ in. in length, and one pupated on 26th. Another attached itself to top of breeding-cage, and was attacked by a third smaller caterpillar. The pupating larva shook himself and wriggled, but the cannibal continued his attack until he had eaten a deepish groove in the mid-dorsal region of his mate, about 20 millim. long and 2 millim. broad. I put fresh leaves in the box when I observed the attack, but the cannibal did not leave his prey until the death of the resting larva the following morning. This larva pupated on April 1st.

The pupal stage lasted on the average ten days for these and for some nearly full-grown wild caterpillars taken on October 30th, 1910, at Mara, on the Berbice Rio. These pupated between November 2nd and 3rd, and the imagines emerged on 12th and 13th.

One of these pupæ attached itself in quite a peculiar way to a leaf-stalk by grasping the thin twig in a groove of the abdomen formed between the sixth and seventh segments, and so hung partially curled round the stalk. The imago successfully extricated itself on November 13th.

The colour of the larva is very nearly the same as that of the green pod of the food-plant, *A. currassavica*, and is doubtless protective. Certainly they are very difficult to detect as they hang on the growing plant.

St. Saviour's Parish, Berbice, British Guiana.

NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

Boralia irrorata, sp. n.

♂. Fore wings pale grey-brown, faintly tinged with pink, finely irrorated with black; a small black discoidal spot; postmedial line represented by black dots on the veins, excurved from costa to vein six, thence almost parallel with termen; black dots between the veins on termen; fringes whitish at tips. Hind wings whitish, tinged with fuscous, except termen and fringes. Under side whitish; fore wings suffused with brownish on costal area and clouded with blackish on the disc; costal area of hind wings powdered with brownish.

Expanse, 35 millim.

Collection number, 1485.

A male specimen from Kanshirei, April 27th, 1908.

Cirphis subdecora, sp. n.

♂. Fore wings pale brown, faintly pink-tinged, costa broadly whitish; a broad, darker, shade-like streak from base of the wing to apex, where it meets a short, oblique, pale streak; veins whitish, with dark longitudinal lines between them on outer half of the wings; dorsal area slightly darker; postmedial line indicated by black dots chiefly towards the costa; terminal line blackish, with black dots upon it between the veins. Hind wings fuscous, whitish towards the base. Under side silvery except at base and on costa of the fore wings, and the base and dorsum of hind wings.

Expanse, 38 millim.

Collection number, 139.

A male specimen from Koannania, June 22nd, 1906.

Trigonophora clava, sp. n.

♀. Fore wings pale brown, slightly pinkish tinged, patched with darker brown on dorsum towards base, on median area except towards costa, and on the terminal area below vein six; the dorsal patch triangular, its base black; reniform and orbicular of the ground colour, clouded with darker, outlined in black, lower extremities united; claviform whitish, outlined in black; subbasal line black, double, angled below costa, not reaching dorsum; antemedial line black, double, curved; postmedial line black, double, oblique, elbowed between veins four and five, terminating on dorsum towards the ante-

medial; subterminal line of the ground colour, inwardly edged with black from dorsum to vein six. Hind wings pale brown, darker on termen; postmedial line dark brown, obtusely angled at vein four; subterminal band dark brown, inner edge diffuse, obsolete towards costa. Under side pale brown; a darker discoidal mark and an elbowed line on each wing; the discoidal mark of fore wings is obscured by a dusky cloud; markings on terminal area as above.

Expanse, 44 millim.

Collection number, 944a.

A female specimen from Arizan, August 31st, 1908.

Allied to *T. subpurpurea*, Leech.

Archanara punctilinea, sp. n.

♂. Fore wings pale brownish, irrorated with darker; a brown streak under the median nervure, its outer extremity diffuse; two black marks in the cell; postmedial line indicated by black linear dots on the veins; black dots between the veins on termen. Hind wings whitish sprinkled with brownish, discoidal spot blackish. Under side whitish; all the wings have a dark brown discoidal spot, and a postmedial line indicated by dark brown linear dots on the veins.

Expanse, 36 millim.

Collection number, 147a.

A male specimen (condition not very good) from Rantaizan, May 8th, 1909.

Seems to come nearest to *A. ærata*, Butler, from Japan.

Archanara nigropunctata, sp. n.

♂. Fore wings pale pinkish brown, broadly shaded with blackish along the median area from the base nearly to the termen; costal area paler, streaked with brown between the veins; veins one to six whitish, freckled with brown; an almost square black spot in the cell, margined in whitish except on lower edge; a short black dash from base below median nervure; postmedial line indistinct from costa to vein six, thence indicated by black dots on the veins; subterminal line indicated by black dots between veins three to seven; a series of black dots, between veins, on termen. Hind wing fuscous, fringes pinkish brown, marked at their base between veins two to seven. Under side of fore wings leaden grey on the disc, whitish on dorsal area; of hind wings whitish, costal area pinkish brown dusted with darker; discal spots and terminal dots black on all wings; traces of a dusky postmedial line on the hind wings.

♀. Similar to the male, but the whitish outline of cell-spot not so distinct.

Expanse, ♂ 40 millim.; ♀ 44 millim.

Collection number, 137.

One example of each sex from Kanshirei. The female captured July 26th, 1908, and the male on November 14th of the same year.

ODONATA IN THE CHRISTCHURCH DISTRICT, 1911.

By E. J. BURGESS SOPP.

WHILST staying in this neighbourhood during the past summer, accompanied by Mr. Philip Dover, I made several expeditions in quest of insects, and our experiences among the dragonflies may be of interest. The "theatre of operations" was limited in area to within a few miles radius of Southbourne-on-Sea, and our observations were confined to the middle and late summer.

It being my first experience of collecting in the district, I am unable to say whether the locality is a generally favourite one with the group, or whether the large number of insects in evidence during 1911 must be mainly attributed to the abnormal weather conditions which prevailed. That the long summer, with its high percentage of heat and sunshine and almost entire absence of wind and rain, would be favourable to the Odonata (especially in such a well-watered centre as Christchurch) seems justly presumable, and it is probable that the conjunction of these factors largely contributed to the extraordinary abundance at certain periods of one or two of the species noted, of which by far the commonest was *Ischnura elegans*, Lind. On some occasions this graceful little dragonfly occurred in the utmost profusion along the banks of the Rivers Avon and Stour, and about the numerous creeks at Wick and Tuckton. During June and July—more particularly in the former month—it was to be met with throughout the surrounding country too—in lanes, meadows, and gardens, often far removed from water.

Regarded solely as a catalogue of species, the appended tale of captures is not a very formidable one. Its interest will lie in its comparison with the experiences of others who may have worked over the same terrain in former seasons, and in the fact that, now Hengistbury Head has been sold, the district may lose much of its wild character in the future.

Sympetrum scoticum, Don.—Hengistbury: not uncommon in July, common at the end of August. Christchurch: Stanpit Marsh.

Libellula quadrimaculata, Linn.—Hengistbury: common in June, scarcer in July. Wick and Tuckton Creeks: common during June. Boscombe.

Orthetrum cærulescens, Fabr.—Hengistbury: not uncommon in July, occasional in August. Mudeford. Bournemouth.

Cordulegaster annulatus, Latr.—A male of this handsome insect was picked up near Pokesdown Railway Station during July, where it had been run over or trodden on in the roadway. A few days later (21st) another insect was seen hawking close to

the ground behind a water-cart, but without a net it was impossible to effect a capture.

Brachytron pratense, Müll.—Hengistbury: one, July 1st.

Æschna juncea, Linn.—Hengistbury: August, not at all uncommon at the end of the month. Southbourne. West Moors.

Æ. cyanea, Müll.—Hengistbury: July 31st.

Æ. grandis, Linn.—Christchurch and Tuckton: July. Hengistbury: July and August.

Calopteryx splendens, Han.—Christchurch: very local among sedges and rank herbage on the banks of the River Avon immediately below the Castle Bridge, where it was not uncommon in July. Although the spot was visited many times previously, the species was not seen until the 7th of this month. Females largely preponderated. It may be of interest to mention that during June and July, 1910, many pairs of wings of this species were picked up at Lower Bockhampton, Londs Mill, Stinsford, Winterbourne Came, and Frome Whitfield, in the neighbourhood of Dorchester, although, curious to say, no living insect was ever met with! Search for severed wings near the insect's haunt at Christchurch was unsuccessful, and swallows hawking for gnats, &c., in the immediate vicinity appeared to disregard the dragonflies altogether.

Pyrrosoma nymphula, Sulz.—Hengistbury and the Christchurch district generally during June and July. Tuckton Creeks: early in August; and one at Hengistbury on the 23rd of the month.

Ischnura elegans, Lind.—Abundant throughout the district from early June to the beginning of August. A few seen at Hengistbury on August 23rd. The deep orange variety, *rufescens*, occurred rarely with the type on the Stanpit Marsh, Christchurch, but was not noticed elsewhere in the neighbourhood.

Bournemouth: February, 1912.

A RARE JAMAICA BUTTERFLY.

By W. J. KAYE, F.E.S.

QUITE recently Miss Fountaine, who has just returned from a prolonged entomological trip to the West Indies and Central America, invited me to inspect her captures. Jamaica was one of the islands visited, and amongst the insects from this locality was a very good specimen of the very rare Nymphaline butterfly, *Chlosyne pantoni*, which was described and figured by me in the 'Entomologist' for 1906.

The type specimen there figured was caught as long ago as 1895, and until the capture by Miss Fountaine it was unique.

It must be a very scarce species, for the lucky captor of the second specimen worked hard for further examples, realizing that her insect must be uncommon, although not knowing at the time what the species actually was, but without success.

Miss Fountaine caught her specimen at Troy, on the edge of the remarkable Cock-Pit County, which is of limestone formation. Mr. Panton took the original example in the Manchester Mountains, which even at the nearest point are a good many miles away. The butterfly was taken in wooded country towards the end of January, 1911, and now that we know the exact locality and almost the exact date, it will be interesting to see if further search will be productive of more specimens.

Miss Fountaine took that fine *Papilio, homerus*, on the Cuna Cuna Pass, and saw several specimens of *P. pelaus*; but I feel I must not say more, however—she personally asked me to record a note on the rare *Chlosyne*.

Caracas, Ditton Hill, Surbiton.

ON THE NAME *SYMPETRUM SCOTICUM*, DON.

[ODONATA.]

BY HERBERT CAMPION.

It would seem that our small black Libelluline, which has been known hitherto as *Sympetrum scoticum*, Donovan (1811), must be called in future *Sympetrum danae*, Sulzer (1776). The reversion to the older name was made by Dr. F. Ris, without comment, in 1909 (in Brauer, 'Sussw. Deutschl. Odon.' p. 41), and the change is discussed and confirmed in his latest contribution to the Selysian Catalogue ('Collections Selys, Libell.', fasc. xiii., p. 646; 1911). The possible claims to recognition of certain other old names need not be dealt with here.

There is little in Sulzer's meagre description of *Libellula danae* ('Geschichte der Insecten,' p. 169), for which he gives the habitat Pais de Vaud, to assist one to identify the particular species described. But the coloured figure (*l. c.* pl. xxiv. fig. 3) shows a *Sympetrum*-like dragonfly with bright red eyes; a large spot of the same colour between the fore wings; light green thorax, crossed longitudinally by a wide median black band; a curved black stripe on that side of the thorax which is exposed to view; abdomen dilated a little below the middle, and narrowing again towards the apex, yellow dorsally, bordered by blackish; wings uncoloured; reticulation black; pterostigmata yellow. The characters upon which I lay most stress are the yellow abdomen, bordered with black, and the broad median black band on the thorax.

After careful comparison of the figure with specimens, I have come to the conclusion that, regarded as a whole, it is a recognisable representation of an immature male of *S. scoticum*. I indicate the male, because it seems to me that the figure resembles that sex more closely than it does the female, with which Dr. Ris has identified it. It is true that, as the figure is drawn, only two anal appendages are shown, but the greater resemblance to the immature male is due to the manner in which the black on the sides of the abdomen is represented as encroaching upon the yellow dorsum: in the immature female, on the other hand, the black is confined to the lateral position.

58, Ranelagh Road, Ealing: Feb. 26th, 1912.

BY THE WAY.

“THE Essex Field Club has distinguished itself in the self-imposed and entirely honourable task of keeping alive an interest in the past history of the county. It has recently taken in hand the restoration of certain tombs, in the churchyard of Black Notley, of two Essex worthies of the seventeenth century. John Ray distinguished himself for versatility as a linguist, as a botanist and zoologist, and Dr. Benjamin Allen, who is buried near him at Black Notley, was the first scientific student of British mineral waters, and a careful entomological observer . . . and these three men, who were friends and contemporaries, were undoubtedly a remarkable trio, whose light shines through the centuries that have elapsed since they walked and worked together!”—Local paper. The late learned Mr. John Ray, as Derham terms him, we all know through the ‘*Historia Insectorum*,’ published posthumously in London, 1710, by Johannes Raius; but who was the second “observer,” and wrote he aught entomological?

We have at length received the first volume of the *Victoria History of Suffolk*, which was published on 31st of last January. The second volume appeared several years ago, but the present has been much delayed from various more or less obvious causes. This one contains the Fauna of the county, and a pretty long catalogue it is. Considering the extreme paucity of observers, and several of those we had ten years ago are departed, the list is a capital one in both botany and zoology. The insects were revised to October, 1907, and show the following totals:—Coleoptera, 1930 species; Hemiptera, 537 species; Orthoptera, 22 species; Neuroptera, 164 species; Lepidoptera, 1290 species; Hymenoptera, 1241 species; and Diptera, 1171 species. The grand total amounts to 6355 different kinds of insects out of a

British total computed at 14,678. This must be considered satisfactory for an area of 1500 square miles, *i.e.* 82 north and south, 56 east and west; but a glance at the supersoils, chalk, sand, clay, peat, and crag, and at the eastern coast-line, southern timber-belts, north-western breck-sands, and north-eastern broad-land will show how rich this county naturally should be in its extremely variable character.

We have had to have recourse to the current quarterly 'Deutsche Entomologische Zeitschrift' for a review of the latest part of 'Biologia Centrali Americana.' Do not we receive this kind of publication for review, or do our editors consider the subject too trans-Atlantic to interest British readers? We know no collectors who have done their work better than those who assisted MM. Godman and Salvin in their great and beautifully executed task.

C. M.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S., &c.

(Continued from p. 136.)

THE 27th was fine and warm, with a light north-easterly breeze. I went to the distant woods. *A. euphrosyne* was now out in abundance, and getting worn; *A. selene* just appearing. I saw three or four *N. lucina* and two *Hemaris fuciformis*. By beating I obtained a few each of *Lithosia areola*, *Erastria (fuscula) fasciana*, *Lobophora hexapterata*, *Cidaria corylata*, *Euchæa obliterata (heparata)*, *H. barbalis*, &c., but common things were far from abundant. The pretty little *Roxana arcuana* was flying merrily over hazel-bushes, and a pair of *Dasychira pudibunda* were taken in cop. high up on a bare aspen pole where they looked very conspicuous. *N. pulveraria* were still appearing in my breeding-cages, and one *Eurymene dolobraria* was also bred. The 29th was fine and bright. I went to the woods in the forenoon and beat one *Drepana hamula* female (which I kept for eggs), one *A. betularia* (typical), several *Asthena candidata*, and *Tortrix ministrana*, but saw little else. In the evening I noticed many half-grown larvæ of *Leucania straminea* on reeds in a dyke on the marshes. The 30th was lovely and warm in the evening, *Perizoma affinitata* and *P. decolorata* were flying in great numbers along a hedgerow overgrown with *Lychnis dioica*. At sugar *N. rubi* was abundant, and one *H. pisi* appeared, but nothing else.

On June 7th I went to Castor, near Peterborough. The 8th was a fine hot day. I went to the woods and found I was too late for *Carterocephalus palæmon* (*paniscus*); I saw many, but they were all too worn to take. *A. euphrosyne*, *Hesperia malvæ* (*alveolus*), and *Thanaos tages*, were flying about blackberry blossom, but were also much worn. One *Parasemia plantaginis* was disturbed out of some rough herbage, where also rather a nice form of *Ematurga atomaria* was plentiful, but very few *Geometræ* were seen, and those only common species. Beating produced a few larvæ of *Polyphoca ridens*, *Tæniocampa populeti*, and *T. munda*. On a sunny bank, overgrown with thistles and *Ononis*, *L. straminea* was plentiful, and larvæ of *Amblyptilia acanthodactyla* were abundant on the *Ononis*, and in a swampy place the larvæ of *Tortrix costana* were numerous, spun up between turned-down or rolled-up tips of leaves of yellow iris, but they were terribly ichneumonised.

On the 10th a friend motored me to the celebrated Monk's Wood, a locality I had long wished to see. We arrived there about 7 p.m., a lovely fine calm evening, and the wood looked as if it ought to be a perfect entomologist's paradise. But, sad to say, nothing appeared to be moving. The wind was from the north-east, and soon after our arrival it began to feel chilly, a heavy dew set in, with slight ground fog in the damper places. The first thing that I noticed upon entering the wood were the numerous privet bushes, some of them already coming into flower, which reminded me that these flowers are attractive to *Thecla pruni*, so I wondered if it were possible to find a larva or two of this species. There were plenty of sloe-bushes about, but a very cursory glance at these revealed the fact that they had recently had a tremendous thrashing by some too ardent collector—or collectors I should think by the results of their efforts—for every likely-looking bush had been well flogged, many of the branches were broken, and the leaves were withering on the mangled twigs. No wonder that this very local species is being rapidly exterminated! In one spot I found a few stunted bushes, not much more than a foot high, that had escaped the beating-sticks, and upon examining these obtained three half-grown larvæ of *T. betule*, but no *pruni*. We had intended to try sugar, but as it continued to get colder and the dew and fog increased, we decided it would be no good, so left the wood about nine o'clock and motored home.

The 11th was fine, with sun and cloud, a light northerly breeze, and a little warmer. This being Sunday I did not go collecting in the forenoon, but in the afternoon went for a stroll to a fir plantation not far from the house, having put my net and a few boxes in my pockets. Tortrices were plentiful, and dozens flew out every time I beat the branches; but there were only two species, in about equal numbers: *Coccyx tædella* and

Retinia pinivorana, both in very fresh condition; and I was pleased at getting a nice series of the latter. In the evening I tried sugar on the trees in the gardens and shrubberies, but saw nothing but a few of the most common species. There was so much honey-dew that moths would hardly look at sugar.

(To be continued.)

NOTES AND OBSERVATIONS.

IDIASPA MARITIMA, Hal., IN SUFFOLK.—This species has not been discovered outside the British Isles. Haliday described it in the old Ent. Mag. 1838, p. 230, under the name *Alysia maritima*, adding, "Habitat sub fucis marcentibus in littoribus Hiberniæ borealis rarissime—Hantoniensibus, F. Walker; Eboracensibus, T. G. Rudd—qui plura exemplaria necum benevole communicavit." It was not again mentioned in literature till the publication of the Rev. T. A. Marshall's "Monograph of British Braconidæ," when (Trans. Ent. Soc. 1894, p. 522) he says it occurs sparingly amongst decaying seaweeds on the coast, quotes the above, and adds: "I have taken it on Lymington Salterns, and Mr. Billups found it at Dulwich." This is all we know of the species, for the same author's reference to it, "Il se trouve parmi les algues pourrissantes, aux bords de la mer, et dans les salines, mais pas communément. Côtes d'Angleterre et d'Irlande" (Bracon. d'Europ. ii. 399), adds nothing. I was, consequently, delighted to take a male of this rare (or overlooked) species on September 1st, 1911, walking leisurely and somewhat sluggishly on the unusually dry mud among the close-set roots of the reeds in Covehithe Broad, on the Suffolk coast, within a quarter of a mile of the sea, but at a spot where the water is at most brackish and by no means salt, and to which seaweed certainly never extends. It will doubtless be found parasitic upon some semi-saltmarsh Dipteron, possibly *Platycephala planifrons*, F., or *Ephydra riparia*, Fln., which occurred in some numbers on the surrounding reeds.—CLAUDE MORLEY; Monk Soham House, Suffolk.

THE SUMMER OF 1911 AND THE PRESENT SEASON.—It will be of special interest this year to note what effect, if any, results from the abnormal season of last year. By way of preliminary record I am able to state that in Bury Wood, Epping Forest, last month *H. leucophaæaria* was unusually common. As early as January 1st a specimen of *P. pedaria* was taken and forwarded to me from Paisley, Scotland. On February 26th another specimen, almost black, was sent to me from the same town, both specimens having been taken from the street-lamps. This afternoon, on the tree-trunks in the Ilford Road, *B. hirtaria* was, without exaggeration, swarming. I have never in the whole course of my experience seen this moth so abundant. On the trunks of two rather small lime-trees in one front garden a friend who was with me and I counted twenty-eight and

seventeen respectively. It remains to be seen whether other species appear in such profusion. By way of explanation I am inclined to believe that the wonderful spell of weather last year caused such abundance of insect life that the town birds (sparrows, &c.) which keep such species as *B. hirtaria* in check had an ample supply of food, and that the persecution of caterpillars was in consequence below the normal standard.—R. MELDOLA; 6, Brunswick Square, W.C., March 30th, 1912.

LARGE "COPPERS" IN WICKEN FEN.—The late Mr. Verrall, it will be recalled, was anxious to re-establish *Chrysophanus dispar* with its nearest existing representative *C. rutilus*. To this end he caused to be "planted" in various parts of Wicken Fen a number of larvæ in the year 1909. I was at Wicken at Easter this year, and called on Mr. G. Bailey, the son of Solomon Bailey, who died two years ago, but who was responsible for the putting out of the larvæ. I learned from Mr. Bailey that not a single "copper" had been seen, and that he accounted for the fact by the abnormally wet and cold summers of 1909 and 1910. Even if the "coppers" had hatched, he pertinently remarked that there was not a great deal of *Rumex hydrolapathum*, their food-plant. In this matter Mr. Bailey is quite correct, and as the water dock requires water to grow in, it does not get much chance of spreading at Wicken, for except in the shallow ditches it can scarcely find suitable spots, all the "lodes" or large watercourses being kept clear of herbage for the adequate drainage of the land. This, however, is a secondary matter; but if further attempts be made to establish large "coppers," it should be borne in mind that scarcity of the food-plant will be a factor acting against success.—W. J. KAYE; Caracas, Ditton Hill, Surbiton.

PARARGE EGERIA: EARLY APPEARANCE.—This species was seen in the New Forest at Eastertide, and about April 22nd it was quite common. I am indebted to Mr. W. J. Lucas for these facts.—RICHARD SOUTH.

CALLOPHRYS (THECLA) RUBI: EARLY APPEARANCE.—April 21st would appear to be an early date for the emergence of *Thecla rubi* in a northern locality. I have pleasure in recording the capture by Mr. A. Graveson of three newly-emerged specimens on the neighbouring high-lying moorland, 1000 ft. elevation. The previous earliest mention of the species in my diary is May 4th. The weather of the past week has been exceptionally warm and summer-like.—FRANK LITTLEWOOD; 10, Aynam Road, Kendal.

[Mr. Lucas informs me that a specimen of *Callophrys rubi* was seen in the New Forest on April 18th.—R. S.]

PYRAMEIS CARDUI IN APRIL.—This morning, while out walking, I saw, and nearly caught, a large specimen of *Pyrameis cardui* settling on dandelions along the roadside. Would this be an early immigrant or a hibernated specimen? In 'Butterflies of the British Isles' it is stated that, so far as is known, the butterfly does not hibernate. I don't know therefore whether you would consider this worth recording or not. The mildness of the climate here might

enable this species to hibernate in this locality, as frost and snow are practically unknown.—HUGH F. STONEHAM; Kinsale, co. Cork, April 1st, 1912.

CELASTRINA (CYANIRIS) ARGIOLUS IN APRIL.—It may be worth recording that *C. argiolus* was seen at Chingford on Saturday, April 13th. Several examples were seen by friends during the week following at Clapton.—R. T. BAUMANN; "Glendale," Chingford, Essex, April 22nd, 1912.

CALYMNIA (COSMIA) PYRALINA IN WEST SURREY.—Last July or August I captured two specimens of the above at Elstead, between Godalming and Farnham. I believe that this insect has not been reported to have been observed in this district before. — H. O. HOLFORD; Elstead Lodge, Godalming.

TEPHROSIA PUNCTULARIA IN EARLY APRIL.—While out this afternoon, not far from Reading, I took among other insects two specimens of *T. punctularia* at rest on tree-trunks. Is this not rather an early date for this species? all the books I have looked over say May and June.—H. L. DOLTON; 27, Brunswick Street, Reading, April 4th, 1912.

BOARMIA CINCTARIA.—Mr. Lucas found a specimen at rest on April 8th, and during the third week of the month the species was plentiful in the New Forest.—RICHARD SOUTH.

NOTES ON LEPIDOPTERA AT GRASSINGTON IN 1911.—My first visit was paid on June 21st, a fine sunny afternoon. In the woods a search on tree-trunks revealed specimens of *Melanthia albicillata*, *Larentia pectinataria*, one specimen of *Coremia designata* (*propugnata*), *C. ferrugata*, a worn example of *Cidaria suffumata*, and one *Hadena dentina*; while on a beech-tree a pair of *Iophophoryx camelinæ* were found *in cop.* Flying in open spaces near the top of the wood were *Lycena astrarche* (*agestis*) and a few *Acidalia fumata*, chiefly males. One specimen of *Ino geryon* was taken, and at dusk a female *Hepialus hectus* was netted. Beating the bushes produced one *Venilia maculata* and several *Emmelesia alchenillata*; the latter were already worn, while *Tortrix pallana* in fine condition seemed plentiful. Flying in the sun was the beautiful *Eumyia octomaculata*, and also *Pyrausta purpuralis*. Sitting among the long grass a female *Parasema plantaginis* was discovered. In July a few days (8th to 13th) were spent in the vicinity, chiefly in the Grass Woods, where *L. astrarche* was now very worn, three or four specimens only of *L. icarus* were seen, but *Erebria æthiops* (*blandina*) was not yet out. Probably the best species taken was *Phothedes captruncula*, which was flying in and out among the bushes in the open spaces near the top of the wood, but was most difficult to capture. It was on the wing but for a few minutes at a time, and could only be taken when there was a fair amount of sunshine. There seemed to be a fair proportion of the reddish form. Of other things seen, *Acidalia fumata* was nearly over, but some nice females were secured. *Tanagra atrata* was flying in the sun, *Boarmia repandata* (on tree-trunks) and *Cidaria pyraliata* occurred, and *Metrocampa margaritaria* was

common at dusk. On the walls near the village several *Nudaria mundana* were seen; and in a garden *Cidaria associata* (*dotata*), *C. prunata*, and *Boarmia gemmaria* were flying at dusk, and also caught by the light from the windows. *Plusia pulchra* was taken at rest, and *Abrostola triplasia* flying over nettles. The moors were not visited, as it was far too hot to roam about in the scorching sun.—W. G. CLUTTEN; 132, Coal Clough Lane, Burnley.

"NEW FOREST NOTES, 1911."—The New Forest being almost "my native heath," I was much interested in Mr. Lyle's notes (pp. 126–130), especially as it is some years since I have been there. I have never been fortunate enough to see *Aporia crataegi* in the Forest, but I had the pleasure of taking some specimens of *Melanargia galatea* there on July 9th, 1889. There was a small colony of them in a damp rushy spot in Ironshill Enclosure, near Lyndhurst Road Station, and as the morning was dull and somewhat heavy they were very lethargic, and many of them seemed to have just emerged. *Argynnis adippe* was common in the same spot, settling as usual on the flowers of the marsh plume thistle, but *galatea* was mostly on the tall grass and rushes. I seem to have had the melancholy privilege of taking one of the last of the New Forest *Leucophasia sinapis*, for I captured a male specimen in Stubby Copse on June 13th, 1888, which is well within the thirty years suggested by Mr. Lyle as the time elapsed since its disappearance. I was glad to see the records of *Gonepteryx rhamni* hibernating in ivy, as, although holly is so much more abundant in the Forest than the flowering ivy, the butterfly's wings so much more closely resemble yellow ivy-leaves in shape and colour that it has always seemed more probable to me that it hibernated in ivy than in holly, although it has been found also amongst the latter. The reason why the specimen in question was so much easier to see at night than by day was obviously that during the night there is no top light shining through the bush and therefore no shadows from above, whilst at night the lantern light shines from below and the leaves catching it at a different angle do not throw such broad shadows, which, however, are more dense and therefore contrast more sharply with the colour of the insect.—C. NICHOLSON; Hale End, Chingford.

CORRECTION.—Owing to an error, *Erebia melampus* should have read *Erebia cassiope* in my article on butterflies at Digne in last month's number of the 'Entomologist.' *E. cassiope* was common on the Doubs on July 31st last summer. *E. melampus* has, I believe, never yet been taken on the Doubs, though Oberthür mentions it as occurring in the Basses Alpes.—GERARD H. GURNEY; Keswick Hall, Norwich.

COLLECTING IN WESTMORLAND, 1911.—The following *résumé* of the season 1911 is, mainly, an account of work done in the environs of Kendal by two entomological friends, Messrs. A. Graveson and T. Smith, and myself, with substantial assistance from Mr. R. H. Mallinson who has provided the Windermere records.

The season opened inauspiciously, the almost incessant rain of the early months being followed by a weary period of five weeks'

persistent and very cold north-easterly wind. Spring geometers were noticeably scarce, with the single exception of *Hybernia ruficaprararia*, which could be taken in numbers on the hawthorn hedges on the few mild evenings of early January. Mr. Mallinson reported males of *H. leucophæaria* common on lamps at Windermere, but our own experience with this species was not encouraging. Four specimens were taken on January 27th, no more being seen until March 3rd, when eleven males, including four of the var. *marmorinaria*, were boxed from the oak-trunks. Again, this year, no females could be found, although the trunks and the grass around were carefully examined after dark, and the lower branches of the trees beaten. *Phigalia pedaria* seemed to be entirely absent, and I do not remember seeing a single example. A few night-feeding larvæ turned up on March 23rd, including *Xylophasia rurea*, *X. hepatica*, and *Apamea unanimis*. Larvæ of *Agrotis lucerneæ*, notwithstanding the cold, were well advanced and approaching full growth by March 29th, and one can only surmise that they had made good progress during the milder though very wet month of February. *Polyphoca flavicornis* appeared at the Windermere lamps in late March, and was accompanied by numbers of the commoner *Tæniocampids*. Of the last, *T. munda* was more than usually abundant, and a fine and variable series was taken. This species comes to light at a late hour, the bulk of the captures being made after 12.30 a.m. The all too brief cessation of the wind was taken advantage of by Mr. Mallinson, who reported the Windermere sallows to be "alive" with moths on the evenings of April 1st and 2nd. Amongst an abundance of *Tæniocampa instabilis*, *T. stabilis*, *T. gothica*, *T. cruda*, and *T. munda*, he took several *T. rubricosa*, two *T. leucographa*, one *Panolis piniperda*, one *Calocampa exoleta*, and one female *D. templi*. On April 6th, again windy, *Anisopteryx oscularia* was found fairly plentifully sheltering beneath projecting pieces of bark on the tree-trunks and lower branches, and even under loose stones at the foot of the tree. On April 14th a specimen of *Pieris brassicæ* was seen flying in the garden; possibly the pupa had wintered in some greenhouse, as the conditions outside had not been of a kind to tempt a natural early emergence. Mr. T. Smith discovered in sloc bloom a rival to the sallows, the flower attracting all the commoner *Tæniocampids*, and in addition, on April 16th, a beautiful female *Lobophora polycommata*, and on the 23rd an odd *Panolis piniperda*. At the end of the month the forcing-cage produced two fine melanic female *N. dromedarius*; a series of *A. rumicis* var. *salicis*, and an odd specimen of *Eucosmia undulata* from larva found on sallow on the "moss" in the previous August.

With the advent of May, however, the weather improved, and we felt that at last we had said "good-bye" to winter! On the 10th *Pieris rapæ*, *P. napi*, and *Euchloë cardamines* were observed, and after dark *Lampropteryx suffumata*, *Melenydris salicata*, and *Lozogramma petraræ*, the latter resting on the dead brackens in the wood. Night-feeding larvæ were not really plentiful; but our captures, principally on heather, hawthorn, birch, and bilberry, included *Eurois prasina*, *Triphaena fimbria*, *T. ianthina*, *Noctua brunnea*, *N. aujur*, *N. triangulum*, *N. festiva*, *N. glareosa*, *Aplecta*

nebulosa, *Leucania lithargyria*, *Agrotis agathina*, *Noctua castanea*, *Plusia interrogationis*, *Boarmia repandata*, *Lygris populata*, *Entephria cæsiata*, and *Acidalia fumata*. A nice little colony of eighteen larvæ of *Cirrhædia xerampelina*, full-fed on May 14th, was the reward of pulling off not more than a square foot of moss on an ash-trunk, but we could not repeat this performance, diligent search afterwards discovering only an odd larva here and there. The species is not rare in the district, ash being one of our commonest trees. Larvæ of *Satyrus semele* and *Gnophos obscurata* were found full-grown on May 14th, the former on grass, the latter on half-a-dozen different rock plants, of which a dwarf variety of the common ox-eye daisy seemed to be preferred. Several perfect *Selenia lunaria* were netted on the 16th, and *Tephrosia crepuscularia*, single-brooded only here, was plentiful in the daytime on oak and larch trunks. The green ova of the latter species, laid in batches, are pushed well into the crevices of the bark and covered over with loose woolly-grey scales.

Throughout May, Mr. Mallinson worked the street lamps with a zeal that certainly merited reward. The illumination provided by the Windermere electric current appears to be appreciated by the moths if not by the residents. The reddish glow of these electric lights proved so much more attractive than the brighter blaze of the incandescent gas-lamps that the latter were very soon abandoned. Again, the electric lights are more favourably situated at the outskirts of the town, in close proximity to several well-wooded estates and private gardens. Mr. Mallinson states that at this season of the year it is useless to begin "lamping" before eleven o'clock, and all the captures recorded below were made between that hour and 1 a.m. Swarming each lamp-post is a necessary part of the business, as all the best things rest on the dark framework of the lamp, and are invisible from the ground; so that a night's work, consisting of three rounds of a mile of lamps, provides enough exercise for even the most enthusiastic collector. It was a great disappointment not to be able to continue the good work during the summer months, and we felt very little sympathy with the economical official mind that suspended the lighting of the lamps between May 21st and August 1st. From May 11th to 19th Mr. Mallinson's captures at these lamps included *S. populi* (one), *N. chaonia* (one male, one female), *P. dictæoides* (common), *P. tremula* (one), *N. trepida* (nine), *N. ziczac* (one), *P. palpina* (one), *D. coryli* (three), *H. pisi* (one), *S. pavonia* (one female), *S. menthastræ* (common), *G. bidentata* var. *nigra* (one), *E. dolobraria* (one), *E. silaceata* (one), *T. dubitata* (two), *B. temerata* (two), *C. designata* (two), and an abundance of *T. crepuscularia*, *L. suffumata*, *M. fluctuata*, *L. petraria*, *S. bilunaria*, and *A. nigrofasciaria*, the last-named species notable for its large size and dark purple clouding. On the night of May 18th, after a two hours' back-aching search by lamp-light on the "moss," a solitary full-fed larva of *Canonympha typhon* was found feeding on the short green spikes of *Rhynchospora alba*. Had we been earlier I have no doubt more would have been obtained, for the insect abounds in this locality. A careful examination of the Cotton-grass, growing amongst the former plant, failed to discover any larvæ; but

I should not like to conclude, upon this slender evidence, that the Beaked Rush is the exclusive food. In all the damper parts of the "moss," where *C. typhon* flies, Cotton-grass flourishes equally with *R. alba*. On May 21st a specimen of *Scodiona fagaria* was taken, our first intimation of the approaching early season. Seven fresh *Thanaos tages*, one *Chrysophanus phleas*, and several *Euclidia mi*, were netted on the 23rd, and at dusk *Coremia ferrugata*, *C. designata*, *M. salicata*, *Hydriomena ruberata*, *Eulype hastata*, and *Perizoma flavofasciata*. Two *Hypocrita jacobæ* were observed on a street lamp at 12 p.m. Ova of *Epione apiciaria*, kept outside during winter, did not begin to hatch till May 31st. The young larvæ fed-up well for three weeks, and then for no apparent reason died off. Young larvæ of *T. crepuscularia* preferred buckthorn to oak, and grew to an enormous size before pupating. Larvæ of *Amathes lota* were beaten from sallow at the end of the month.—FRANK LITTLEWOOD.

(To be continued.)

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 7th, 1912.*—The Rev. F. D. Morice, M.A., President, in the chair.—The President announced that he had nominated as Vice-Presidents for the present session Mr. A. H. Jones, Dr. Malcolm Burr, and Mr. J. H. Durrant.—Mr. W. E. Sharp exhibited specimens of *Carpophilus 6-pustulatus*, F., and *C. obsoletus*, Er., taken under bark of beech-trees, near Doncaster, in October, 1912.—Professor Poulton, a large but not quite complete series of the members of the important combination of Geometrid moths of the genus *Aletis*, and their mimics, collected between May 23rd, 1909, and September 14th, 1910, by Mr. C. A. Wiggins, D.P.M.O. of the Uganda Protectorate, in the neighbourhood of Entebbe. Professor Poulton also exhibited part of an all-*anthedon* family, recently bred by Mr. Lamborn at Oni Camp, seventy miles east of Lagos, from an *anthedon* female parent, and part of an all-*dubius* family, also bred from an *anthedon* female; also specimens of the Lasiocampid moth, *Mimopacha gerstaeckeri*, Dewitz, bred from the caterpillars referred to by Mr. Lamborn. The hairs on the larvæ are intensely urticating, and, as they come off readily, float in the air if there is any draught. They get into the eyes and produce a troublesome conjunctivitis. Professor Poulton drew attention to the following observation recently made by Mr. Lamborn at Oni:—"On December 27th I saw a male *Glutophrissa saba* courting a female. She was resting on a leaf with wings expanded. Her abdomen was raised to an angle of rather more than forty-five degrees to the thorax, and two little tufts very similar to those possessed by male *Danainæ* protruded from the anal extremity."—Dr. Malcolm Cameron, a new species of *Vesperus* from Lagos, Portugal, *V. reitteri*, and for comparison a specimen of *V. bolivari*, Btt. In both cases the females are unknown.—Mr. E. A.

Cockayne, the following specimens of the genus *Oporabia*: *O. christyi* from Ireland and Scotland, hybrid *O. christyi* ♂ × *O. dilutata* ♀, and *O. dilutata* ♂ × *O. christyi* ♀; *O. dilutata* from Scotland and Epping Forest, hybrid *O. dilutata* ♂ × *O. autumnaria* ♀, and larva; *O. autumnaria*, hybrid *O. autumnaria* ♂ × *O. filigrammaria*, ♀ and *O. filigrammaria* ♂ × *O. autumnaria* ♀; *O. filigrammaria* from Yorkshire and Scotland.—The following papers were read:—"On Some hitherto imperfectly known South African Lepidoptera," by Roland Trimen, M.A. F.R.S. "On the Comparative Anatomy of the Genital Tube in Male Coleoptera," by D. Sharp, M.A., F.R.S., and F. Muir, F.E.S. "Descriptions of New Species of Lepidoptera-Heterocera from South-east Brazil," by F. Dukinfield Jones, F.Z.S., F.E.S. "The Effect of Oil of *Citronella* on Two Species of *Dacus*," by F. M. Howlett, B.A., F.E.S. "On the Genera *Liothrips* and *Hoodia*," by Dr. H. Karny, of Ellbogen, Austria; translated by E. A. Elliott, F.E.S., and communicated by R. S. Bagnall, F.L.S. "On the Early Stages of *Albulina pheretes*, a Myrmecophilous Plebeiid Butterfly," by T. A. Chapman, F.Z.S. "The Food-plant of *Callophrys avis*," by T. A. Chapman, F.Z.S. "An Experiment on the Development of the Male Appendages in Lepidoptera," by T. A. Chapman, F.Z.S. "The Study of Mimicry (Batesian and Müllerian) by Temperature Experiments on two Tropical Butterflies," by Lieut.-Col. N. Manders, R.A.M.C., F.Z.S., F.E.S. A long and important discussion arose on many points in connection with the last paper, in which several Fellows took part.

Wednesday, March 6th, 1912.—The Rev. F. D. Morice, M.A., in the chair.—The following gentlemen were elected Fellows of the Society:—Messrs. Harold Hodge, Chapel Place Mansion, 322, Oxford Street, W.; Samarendra Maulik (Calcutta), c/o Messrs. T. Cook & Son, Ludgate Circus, E.C.; Roland T. Smith, 54, Osbaldeston Road, Stoke Newington, N.—Mr. Donisthorpe exhibited a specimen of *Catops montivagus*, Heer, new to the British list, taken at Nethy Bridge on June 27th last, under a dead squirrel; also *C. tristis*, Panz., for comparison, the nearest species previously known as British.—Professor Poulton, the first of three families of *P. dardanus*, Brown, bred from *hippocoon*, F., females in the Lagos district by W. A. Lamborn, and a part of the second. He stated that these three families were the first successful attempt, outside Natal, to breed *P. dardanus* from a known female parent. He also drew attention to the following letter, received by Mr. W. A. Lamborn from Captain H. V. Neal:—"You have asked me about monkeys eating butterflies. This is very common, as every native will tell you. I have seen it myself. The monkey runs along a path, sees some butterflies fluttering round some filth, goes very quietly and seizes one by the wings, puts the solid part [body] into his mouth, and then pulls the wings off. The poor butterfly goes down like an oyster." Professor Poulton said that he had now submitted to Professor R. Newstead some of the Coccids which formed the food of *S. lemolea*, H. H. Druce. They had been sent in spirits by Mr. W. A. Lamborn and, although unfortunately badly attacked by fungus, had been placed without hesitation in the genus *Dactylopius* by Professor Newstead. Pro-

fessor Poulton exhibited examples of *Eurytela dryope*, Cramer, and *E. hiarbas*, Drury, bred by Mr. W. A. Lamborn in the Lagos district. Mr. Lamborn had bred considerable families of *dryope* three times, and *hiarbas* once, from known female parents. The *dryope* parents produced nothing but *dryope*, the *hiarbas* nothing but *hiarbas*. It was therefore almost certain that the two forms were distinct species, at any rate in the Lagos district. Professor Poulton exhibited specimens of *Pseudacraea*, &c., captured on December 3rd, 10th, and 17th, 1911, by Dr. Carpenter, in the primitive forest which still exists in the centre of Damba Island.—Mr. A. E. Gibbs, two specimens of the scarce butterfly *Baronia brevicornis*.—Mr. Douglas Pearson, a drawer of aberrations of the genera *Melitæa* and *Erebia*, amongst which were some striking forms of *E. stygne*, *E. ceto*, and *M. varia*, as well as a remarkably variegated female of *M. aurelia*, generally speaking the most constant of the group.—Dr. Jordan, on behalf of Dr. Malcolm Burr, two specimens of a new Dermapteron, discovered in vast numbers in a cave in Java, for which a new sub-order is required.—GEORGE WHEELER, M.A., *Hon. Sec.*

RECENT LITERATURE.

Dermaptera (Fascicule 122 of the 'Gonera Insectorum'). By M. BURR, D.Sc. Pp. 112; illustrated by eight coloured and one plain plate. Brussels, 1911.

SUCH a publication as the one before us cannot but mark an epoch in the history of the Dermaptera, a group of insects better known to the ordinary naturalist as the "earwigs." One publication only would be even more welcome—the promised monograph of these insects which our author has in hand. Owing to a great extent to the comparative scarcity of material the classification of these ancient, and therefore specially interesting, creatures has been in an almost hopeless state of confusion, but the strenuous labours of Burr and others have altered the position of affairs. In the fine volume devoted to the Dermaptera in the 'Fauna of British India,' Dr. Burr gave us a definite scheme of classification of the earwigs, and in the present publication we have it brought still further up to date. In the Introduction will be found the principles of classification adopted. Differences in the genitalia must, of course, enter largely into the various diagnoses, but we are glad to find that Burr does not consider them all-important. The average entomologist, though he may not be specially a student of the earwigs, will often like to properly place his specimens, and he will have a much better chance of succeeding if he has not to depend entirely on such an abstruse point as the construction of the genitalia.

It is to be hoped that the system of classification and the nomenclature of the earwigs is now fairly fixed. The seven hundred and one species here enumerated are distributed amongst eight families, including the Arixeniidæ and Hemimeridæ with one species each. These families of parasitic insects are much more pronouncedly

distinct than the other families, but it appears to be settled now that they belong to the earwigs. Whether these, with the true earwigs, should be given ordinate rank seems to be debatable. On the same terms the list of natural orders would probably become as unmanageable from the greatness of its numbers as it was previously from the paucity in that respect. Possibly, however, this is unimportant, as these insects constitute a thoroughly compact and natural group—though not more distinct than their neighbours, the cockroaches.

Our own little company of seven species, which as breeding in these islands may all be considered British (though two have been introduced), are, indeed, lost amongst the seven hundred odd species here enumerated. As, however, to us they are important, they are here quoted:—

	Family.	Subfamily.
<i>Anisolabis annulipes</i>	Labiduridæ	Psalinæ.
<i>Labidura riparia</i>	Labiduridæ	Labidurinæ.
<i>Labia minor</i>	Labiidæ	Labiinæ.
<i>Prolabia arachidis</i>	Labiidæ	Labiinæ.
<i>Apterygida albipennis</i>	Forficulidæ	Forficulinæ.
<i>Forficula auricularia</i>	Forficulidæ	Forficulinæ.
<i>Forficula lesnei</i>	Forficulidæ	Forficulinæ.

Three others (perhaps more) have occurred sporadically:—*Anisolabis maritima* (fam. Labiduridæ, subfam. Psalinæ); *Chelisoches morio* (fam. Chelisochidæ, subfam. Chelisochinæ); and *Anechura lewisi* (fam. Forficulidæ, subfam. Anechurinæ).

In type and get-up this fascicle has a particularly pleasing appearance, while the plates are indeed excellent. Sixty species are figured in colours, a number of others are plain, and there are numerous beautiful drawings of details.

It would be very nice of the author if he would publish periodically notes which would keep up to date all those—an increasing number, we hope—who are interested in the earwigs.

W. J. LUCAS.

Annals of Tropical Medicine and Parasitology. Liverpool.

THE two parts just received contain little of purely entomological interest, four short notes only falling under this head. In Series T. M. vol. v. No. 3, Dec. 30th, 1911, we have: "Some Experiments on Larvicides," by Sir R. Ross and E. S. Edie (pp. 385-390); and "An Examination of the City of Georgetown, British Guiana, for the breeding-places of Mosquitos," by K. S. Wise (pp. 435-441). In Series T. M. vol. v. No. 4, Feb. 26th, 1912, there are: "The Genus *Pristirhynchomyia*, Brunetti" (Diptera), by Capt. W. S. Patton and Capt. F. W. Cragg (illustrated, pp. 509-514); and "The Life-history of *Philæmatomyia insignis*, Austen" (Diptera), also by Patton and Cragg (illustrated, pp. 515-520).

W. J. L.

OBITUARY.—We regret to learn that Professor JOHN B. SMITH, State Entomologist of New Jersey, U.S.A., died on March 12th last.

THE ENTOMOLOGIST

VOL. XLV.]

JUNE, 1912.

[No. 589

NOTES ON *RHOPALOSIPHUM SOLANI*, KALTENBACH.

BY FRED. V. THEOBALD, M.A., F.E.S., Hon. F.R.H.S.

I FOUND this aphid on potato-haulm at Wye in June and July, 1911, but only a few apterous females and a single winged female on June 28th. In February of this year a number of seed potatoes were sent me from Folkestone, the sprouts so badly attacked by aphid that they were all dying off, and the thick honeydew formed by the "dolphins" had smothered the tubers, which gradually turned brown and rotted away.

On comparing the wingless females with those I found on the potato-haulm in June and July of last year I found them to be identical, and they agree exactly with Kaltenbach's description of *Aphis solani* (Mono. Pflanzenläuse, p. 15). This is placed as a synonym of Schrank's *dianthi* by Buckton. No damage has been reported as caused by this aphid to my knowledge, but John Curtis, in his famous work on Farm Insects, refers to aphid on potatoes (pp. 68 and 428), and calls them *Aphis rapæ*, or *vastator*.* Writing on the aphid in connection with potatoes he says: "That aphides will puncture the potato-leaves there can be no doubt and so incline them to wither, but there is no proof of them poisoning the plant and so causing the rot . . . but in no instance have I seen aphides on potatoes in sufficient numbers to destroy the crop, or even to injure the produce." He then lists the aphides he had found on the potato, namely, *Aphis rapæ*, Curtis; *A. humuli*, Curtis; *A. persicæ*, Morren; *A. fabæ*, Morren; and *Schizoneura lanigera*, Haussman; and refers to the last as being only an accidental visitor.

The specimens I received from Folkestone were nearly all apterous females; on February 25th I found a few nymphs, and on March 1st winged females commenced to appear.

Kaltenbach only describes the wingless form, consequently I describe in detail the alate female here. At the present time (May 24th) they are still breeding on potatoes, alate forms occurring irregularly.

It may also be pointed out that in each of the six colonies

* *Aphis vastator*, Smec, is considered by Schouteden to be *Rhopalosiphum dianthi*, Schrank.

sent me there were some pink forms mixed with the green and yellowish green normal specimens. The winged females that have come from the pink forms are identical with those from the green ones.

I found that this aphid lives quite well underground, and the alate females emerged from the soil in which I had placed one of the diseased tubers. It thus looks as if this aphid lays its ova on the tubers in the autumn, and there they remain until they sprout and so are ready to work on the young shoots. A few years ago I remember finding a few aphid eggs on some potatoes, and probably they were of this species.

I have no other records of it outside Kent except Kaltenbach's. Walker in his List (p. 990) also refers to it with a query as a synonym of *dianthi*, Schrank. It clearly comes in the genus *Rhopalosiphum*, the cornicles being most marked in the alate and apterous females, but not in the larvæ and nymphs.

Alate female, first generation.—Head black; antennæ brown, basal segment black, the second also rather dark, the third a little longer than the fourth, the fourth a little longer than the fifth, the sixth nearly as long as the fourth and fifth, the third with eight to ten sensoria on one side along nearly the whole length of the segment, the remainder of segments are striated (Fig. I., A).

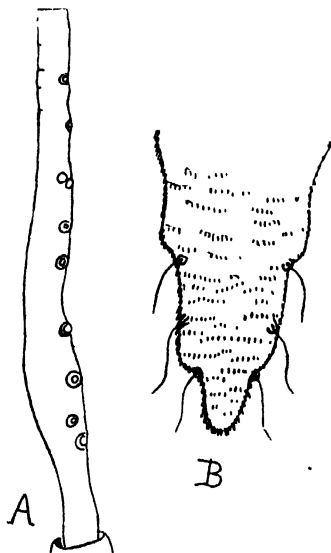


FIG. I.—*Rhopalosiphum solani*, Kalt.
A. Third antennal segment (winged female). B. Cauda.

Thorax: collar yellow, disc black in the centre, yellowish around and on the sides, which have also black areas. The black area not markedly trilobed as in *R. dianthi*.

Abdomen deep yellowish green with black transverse bars, thin and indistinct on the first two segments, which have sub-median black spots, the bars thick in the middle four segments, usually uniting into a dark mass, and there are also large prominent lateral black spots; a dark area running from base of conicles to the cauda.

The cornicles dark and slightly swelling towards their apices, cauda dark, acuminate, with three pairs of lateral hairs, surface and edges spiny. Legs yellowish, femora black on the apical half, apex of tibiae and tarsi black, the paired ungues rather long.

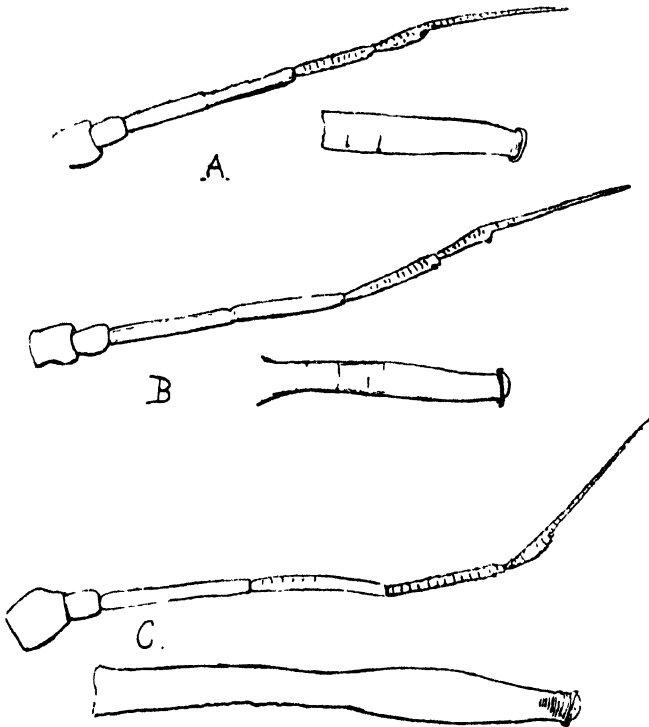


FIG. II.—Antennæ and cornicles of *Rhopalosiphum solani*, Kalt.
A. Pink larva. B. Pink nymph. C. Green apterous female.

Wings normal, with brown stigma. Venter yellowish green to green, mesosternum black. Some specimens have the ground colour almost all yellow. The proboscis appears to be banded with narrow, dusky, and pale areas. The abdomen much darker than in *dianthi*.

Apterous female.—Variable in colour: bright apple-green, dull green, and pinkish, shiny. Three forms occur, as follows:—

- a. Pale green to yellowish green; antennæ pale green, dark on the apical halves; cornicles green, with small dark apical areas. Legs green, apex of tibiae and tarsi dark. Eyes reddish black; cauda green, tips of the cornicles nearly level with its end.

- β. Bright apple-green; head dark; eyes reddish brown; two basal segments of antennæ dark, the third pale at the base, remainder dark; cornicles dusky, projecting a little beyond the tip of the dark caudal process. Legs dusky green, darker at the apices. Proboscis pale green, dark at the apex, reaching just past the base of the second pair of legs.
- γ. Pale pink, with occasional ochreous areas.

In all the cornicles have marked transverse lines, and the third segment of the antennæ is longer than the fourth, the fourth slightly longer than the fifth, the sixth about equal to the fourth and fifth. Caudal process much as in the alate female (Fig. I., v).

Nymph.—All pale yellowish green or pinkish to yellowish brown. In some the head is pinkish, the thorax dull yellowish, and the abdomen pinkish. Wing-buds dusky at the apices and sides. Legs pale dusky at their apices; antennæ pale, dark on the apical half; cornicles pale, dark at their tips.

I have retained Kaltenbach's name for this potato aphis, although it certainly approaches Schrank's *dianthi*. The sensoria on the third antennal segment of the alate female nearly agree with one another, but the general appearance of the insects differ, and also the thoracic and abdominal markings. Moreover, I could not get it to breed on peach or nectarine.

NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

Urapteryx inspersa, sp. n.

♂. Fore wings white, heavily freckled and striated with greyish; antemedial and postmedial lines broad, brownish grey, oblique, the former nearer to the latter on dorsum than on costa; narrow spaces before the antemedial and beyond the postmedial lines free of freckling; discoidal mark linear, inconspicuous. Hind wings white freckled with greyish on terminal area; medial line broad, brownish grey, straight, not extending to costa or to dorsum; a black mark on each side of vein four before the tail, the upper one scarlet mixed. Fringes of all the wings pale brown, terminal line on the hind wings reddish brown. Under side white, transverse markings of upper side faintly indicated.

Expanse, 53 millim.

Collection number, 1545 a.

Two male specimens from Rantaizan, May 9th and 14th, 1909.

In the cotype the upper mark before the tail is more scarlet than black.

Urapteryx approximaria, sp. n.

♂. Fore wings white, faint brownish striæ on costa; antemedial and postmedial lines pale brown, oblique, approaching towards dorsum; discoidal mark brownish, linear; fringes pale brown,

darker at apex, whitish at tornus. Hind wings white, faint brownish striæ on terminal area; medial line brownish, straight; a brownish cloud edged with black at base of tail; fringes red-brown, whitish at tornus. Under side white; two dusky transverse lines on fore wings.

Expanse, 52 millim.

Collection number, 1546.

A male specimen from Kanshirei, April 21st, 1908.

Obedia octoscripta, sp. n.

♂. Fore wings yellow, white on basal two-thirds of dorsum; basal third with three transverse series of black spots; two large 8-shaped black marks on costal portion of medial area; a post-medial series of nine black spots, four to six smallest, seven and eight largest, the latter placed inwards and rather out of line with the others of series; a subterminal series of seven black spots, the second double, terminal line black; fringes yellow chequered with black. Hind wings white, black spots towards base, terminal third yellow, traversed by two series of black spots. Under side as above.

Expanse, 46 millim.

Collection number, 1572.

A male, Arizan, August 14th, 1908.

Comes near *O. targetai*, Ob.

Eucherodes agnes subalba, ab. nov.

♀. Fore wings white, dark markings broken up and intersected by the ground colour. Hind wings white; medial line dusky, diffuse, excurved from costa to vein four, thence incurved to dorsum. Under side white, veins brownish; fore wings ochreous brown on the costa, a brownish cloud in the cell, and a brownish spot at outer end of the cell; medial line blackish, sinuous, united with a brownish cloud near the costa; medial line of hind wings brownish, double, united below the middle; discoidal spot and traces of subterminal band brownish.

Expanse, 60 millim.

Collection number, 1551.

A female specimen from Arizan (7300 ft.), August 8th, 1908.

Glaucopteryx latifasciata, sp. n.

♂. Fore wings greyish brown, clouded and striated with darker; basal area reddish brown, limited by two curved black lines enclosing a diffuse dusky line; central fascia brown outwardly clouded with blackish, narrowed towards dorsum, the outer dentated edge outlined in white and followed by a reddish brown band enclosing an interrupted black line, the inner edge indented above dorsum, bordered by a reddish brown double line; subterminal line pale, wavy, only distinct towards dorsum, where the terminal area is suffused with blackish; the veins on terminal area reddish brown, a black mark below apex. Hind wings pale brown, almost whitish; faint traces of a dusky postmedial line and a subterminal band. Under side pale brown, irrorated with darker brown; a blackish discal dot and an

irregular postmedial line on all the wings, the area within the post-medial line suffused with dusky.

Expanse, 40 millim.

Collection number, 1581a.

Two male specimens from Arizan (7300 ft.), August 8th, 1908.

Lygris convexa, sp. n.

♂. Head and thorax white marked with blackish, metathorax and palpi tipped with tawny; abdomen white, four black dots on basal segments, anal segment blackish. Fore wings white, with four bands, formed of blackish lines, running from costa to just above tornus, where they are edged with tawny; the first and second of the four lines forming the subbasal band only run to just beyond the middle of dorsum; the antemedial and postmedial bands, each of three lines, curve round one into the other above tornus; the first of the three lines forming subterminal band joins the postmedial at about middle, but the other two lines are not extended beyond this point; a brownish oblique streak before the antemedial band, and a small blackish spot above dorsum towards tornus. Hind wings white, tornal half of outer area tawny, enclosing dark greyish edged white spots, and limited above by dark grey wavy lines. Under side white; a black discoidal spot, elbowed postmedial, and interrupted subterminal bands on forewings.

Expanse, 50 millim.

Collection number, 1562.

One male specimen from Kanshirei (1000 ft.).

Allied to *L. ludovicaria*, Oberthür.

Lygris basistrigaria, sp. n.

♂. Head and thorax white marked with grey-brown; abdomen white, inclining to ochreous posteriorly, barred with grey-brown. Fore wings white; basal and antemedial oblique bands grey-brown, broad, enclosing lines and streaks of the ground colour (the basal half of the wing might be described as grey-brown transversely, streaked with white); postmedial band grey-brown, slightly excurved between veins four and two, tapered towards dorsum, enclosing a white line towards costa; subterminal band represented by three grey-brown lines, the first two united above tornus, the third short; a grey-brown line, broken up into spots towards tornus, before the blackish terminal line; tornal area of outer margin ochreous. Hind wings white, inclining to pale ochreous on outer margin; discoidal spot grey-brown; an ochreous patch, with obscure blackish spots on it, above tornus; three blackish spots on termen about middle. Under side white; all the wings have blackish discoidal spot, postmedial band, interrupted subterminal band, and mark above middle of termen; the hind wings are marked with ochreous above tornus.

Expanse, 46 millim.

Collection number, 1563.

A male specimen from Kanshirei, May 7th, 1908.

Allied to *L. constricta*, Warren, from China.

BRITISH ODONATA IN 1911.

By W. J. LUCAS, B.A., F.E.S.

(Concluded from p. 144.)

ON August 10th Col. J. W. Yerbury sent me a few dragonflies from the North of Scotland. A male *C. annulatus*, Nethy Bridge, August 6th; two males, *Æschna juncea*, Nethy Bridge, August 6th and 7th; one male *L. quadrimaculata*, Nethy Bridge, August 7th; one male *Sympetrum scoticum*, Nethy Bridge, August 7th; one male *S. scoticum*, Spey Bridge, August 8th; and three females, *Lestes sponsa*, Aviemore, August 10th. For experiment, the three *L. sponsa* were despatched while still alive in small tubes. Unfortunately they had to be readdressed to me from Kingston to the New Forest. Two arrived dead, but the third was quite alive, notwithstanding the length of time on the journey.

On his return south the same entomologist gave me a most interesting little collection of dragonflies he had taken during his summer visit to the North of Scotland. Amongst them was a pair of insects belonging to the genus *Sympetrum*, which are either new or else constitute a very distinct race of *S. striolatum*. In 1900 (*vide* Entom. vol. xxxiii. p. 139) I called attention to and figured details of a dragonfly, one of two females brought by Mr. H. S. Fremlin from Stornoway in 1899. There was some doubt about their identity, and Mr. McLachlan seemed to think the specimens might be hybrids between *S. striolatum* and *S. scoticum*. Though a very unsatisfactory conclusion, it was left at this. Now Col. Yerbury has captured a pair at Lochinver (June 24th and July 7th, 1911), in Ross, the very counterpart of the two females from Stornoway. These I describe as *Sympetrum nigrescens*:—

Description.—Vertex ochreous; anterior to it a rather broad black band, extending to some extent downwards along the side of the eyes as in *S. vulgatum*. Rest of face ochreous, rhinarium and neighbourhood being rather lighter; hairs black. On the mesonotum two distinct narrow longitudinal yellowish streaks. Ground colour of sides of thorax nearly black, with two large bright yellow oblong spots; between these four small ones, and below them, three others, all bright yellow; under surface of thorax very dark, with bright yellowish markings. The thorax recalls very strongly that of *S. scoticum*. Wing-nervures black; pterostigma as in *S. striolatum*. Fore legs black, with femur somewhat ochreous below; mid and hind legs black; all legs with a fine ochreous line along the tibia. Abdomen blackish below; ridges outlined in black; two black dorsal dots on several of the segments. In the female there are, in addition, strong black lateral lines on the segments of the abdomen. Genitalia much as in *S. striolatum*. In the male the internal hamular branch perhaps a little more blunt and the external one a little sharper

and more distinct. The margin of the vulvar scale nearly straight, barely hollowed. Size between that of normal *S. striolatum* and *S. scoticum*. General appearance so distinct from normal *S. striolatum* that one was relaxed, set, and put in the cabinet with *S. scoticum* before the difference was noticed in size and pterostigma.

Other specimens were:—*S. scoticum*, a female, Nethy Bridge, August 11th. *L. quadrimaculata*, a male, Inchnadamph, Loch Assynt, June 2nd; a female, Inchnadamph, Loch Assynt, no date; a male, Loch Assynt, June 8th. *C. annulatus*, a female, Loch Assynt, June 6th. *Æschna cyanea*, a male, Loch Assynt, June 6th; a female, Loch Assynt, June 3rd—a new locality for this scarce and interesting species. *Æ. juncea*, a male, Nethy Bridge, September 4th. *L. sponsa*, a male, Lochinver, July 9th. *P. nymphula*, two females, Inchnadamph, June 1st; two males, Loch Assynt, June 10th and 12th; a male, Lochinver, June 23rd; a male and a female, *in cop.*, Lochinver, July 9th; a female, Nethy Bridge, July 28th. *I. elegans*, a male, and a nice female var. *rufescens*, June 20th; a male, July 1st; a male, July 9th; and a male, July 16th—all at Lochinver. *E. cyathigerum*, a male, June 20th; three males, June 21st; a male and a female, *in cop.*, June 23rd; a female, June 24th. In addition, there were the following nymphs or skins:—One *C. annulatus*, apparently immature, picked up on the shore of Loch Assynt, June 13th; one *C. annulatus*, Lochinver, June 28th or 29th, found alongside a freshly emerged male imago; one *C. annulatus*, Lochinver, June 27th, on trunk of alder, banks of Inver; one *E. cyathigerum*, Lochinver, July 11th, apparently the nymph-skin from which emerged a very teneral female sent with it.

Writing from Nethy Bridge, August 22nd, Mr. J. J. F. X. King said of *Agrion hastulatum* that, though he met with the males in fair numbers, he found the females scarce, at their habitat at Aviemore. The species is on the wing only for a short time, hence the difficulty in obtaining specimens.

In addition to the examples of *S. fonscolombii* previously mentioned, Lieut.-Col. Nurse showed me other dragonflies taken in the East of England in 1911. *Brachytron pratense*, two males, Chippenham, Cambridgeshire, May 21st and June 16th. *Æschna cyanea*, a male, Stowmarket, Suffolk, August 2nd. *P. nymphula*, five males, Chippenham, May 17th. *I. elegans*, a female, Wicken Fen, Cambridge, May 28th; and a female, Chippenham, June 16th. *Agrion puella*, two females, Ampton, West Suffolk, May 18th and August 13th.

Mr. G. O. Sloper sent me from Oughterard, co. Galway, Ireland, a male and a female of *Æ. juncea*, taken on September 11th, 1911.

Writing on November 22nd, Mr. N. P. Fenwick, Jun., gave a few notes on his doings amongst the Odonata during the year. He said:—"This year I first saw *Æ. grandis* on July 8th, when

I took two males on the River Mole. *Platynemis pennipes* has been very scarce there this year; but one or two *Erythromma naidas* were about at the beginning of July. On July 24th I saw a large *Æschna*, which I am pretty sure was *grandis*, hawking up and down amongst the motor-buses in Cornhill. On the previous day I saw on the Mole an *Æ. grandis* pounce on a *Pieris rapæ* which happened to fly near. It quickly bit off the wings of the butterfly and departed with the body in its mouth. During the latter half of August and September I was shooting in Achill Island, co. Mayo, and was surprised to find that the Odonata there were chiefly conspicuous by their absence. However, one or two *S. striolatum* were to be seen, and also an occasional *I. elegans*. The weather was not good, and this may account for their scarcity to a certain extent."

Though the fine weather continued into the autumn, late records for dragonflies were disappointing. On October 1st, near Bedford, I saw one example, which was no doubt *S. striolatum*, while at the Black Pond, Surrey, on Oct. 28th, I watched a few which, with still less doubt, belonged to that species. These were the last I saw. Mr. G. T. Lyle, however, found that species common in the New Forest on November 5th. Miss A. Sharp tells me that on November 1st she saw a big one in the New Forest, but could not name it. Assuming it to have been an *Æschna*, a certain record of it would have been very interesting.

Kingston-on-Thames: March, 1912.

NOTES ON THE DRAGONFLY SEASON OF 1911.

By F. W. AND H. CAMPION.

NOTWITHSTANDING the long and brilliant summer of 1911, dragonflies did not seem to be particularly abundant on the few occasions when we had opportunities for observing them. However, twenty-four species were met with during the season by ourselves or by our fellow collector, Mr. H. J. Watts, and a certain number of the captures made seem to be worthy of mention.

On August 14th Mr. Watts showed us a male of *Sympetrum flaveolum* which he had taken the day before at Wisley, Surrey. We visited the same pond ourselves on August 26th, and took two more males, all the specimens which were seen. Again at Wisley, on August 20th, Mr. Watts obtained a female of *S. danae*, Sulz. (= *S. scoticum*, Don.) exhibiting a very interesting malformation. The tips of both fore wings presented the appearance of a piece of soft paper which had been twisted into a screw between the thumb and forefinger, and the abnormal condition was no doubt due to incomplete inflation of the wings, through

one cause or another, at the time when the nymph was transforming into the imago. It is probable that, if the insect had lived for some time longer, the twisted tips would have fallen away, and the wings would have assumed the abbreviated form with rounded apex which is met with occasionally, as an individual peculiarity, in different species of Anisoptera. In the present case the right wing is affected to a greater extent than the left, the entire area lying beyond the nodus being malformed. Mature and immature specimens of *S. sanguineum* were taken at Ramsey, Hunts, on July 8th, and the species was flying in great numbers at Wisley on August 26th.

A male of *Cordulia ænea* occurred to Mr. Watts at Byfleet on May 21st, and a female was taken by ourselves near the Black Pond on June 16th. Search was made for *Somatochlora metallica* in Surrey, where it occurred in 1910, but no specimens were procured.

Mr. Watts informs us that he took an emerging imago of *Brachytron hafnense* at Byfleet on May 21st, and found the species plentiful at Wisley on May 28th. A male of *Æschna mixta* was caught at Wisley on August 20th (H. J. Watts). Between, and including, September 3rd and 10th Mr. J. C. Ashby found *mixta* in abundance at Hunton, near Yalding, Kent, and he showed us several specimens which he had taken.

Libellula depressa, *Orthetrum cærulescens*, *Calopteryx virgo*, *Pyrrhosoma tenellum*, and *Agrion mercuriale* were among the species taken at Brockenhurst, in the New Forest, on June 11th (H. J. Watts). At the same time and place a male imago of *Æschna cyanea* was obtained with the nymph-skin from which it had just escaped. This is the earliest emergence of the species known to us. A female *cyanea* was taken by ourselves at Ramsey on July 8th. On July 11th, an unusually early date, Mr. Watts found *Æ. grandis* already on the wing at Ely.

The same observer noted *Calopteryx splendens* at Wisley (May 28th and July 23rd); Silvertown, on the River Exe (June 4th); Arundel (July 9th); and Ely (July 11th).

A few adult males of *Lestes dryas* were taken near Ramsey, Hunts, on July 8th. In consequence of information kindly furnished to us by Mr. S. W. Kemp, we were able to identify the ponds near Hanwell, Middlesex, where in 1902 he discovered a large colony of this interesting species. We found that we knew the ponds already, and had examined them for Odonata in 1910. We paid several further visits to the place in 1911, but no trace of the species could be found in either year. Mr. E. A. Waterhouse has been so good as to give us specimens of *dryas* taken by himself at the ponds in question on July 17th, 1902, in company with Mr. Kemp, and further (teneral) examples obtained there on June 26th, 1903. Mr. Waterhouse tells us that he has not seen the insect since 1903, although he has been to the

ponds again for water-beetles on several occasions, and as recently as 1909.

According to Mr. Watts' observations, *Erythromma naidas* had a very long season, for he took his first specimen (a female) at Byfleet on May 21st, and his last (two males at Wisley) on the exceptionally late date August 20th. *Pyrrhosoma tenellum* was found at the Black Pond on June 16th, 18th, and 20th, but the specimens obtained were rather immature. The species was met with there, also, on August 24th and 27th. Again, at the Black Pond (June 20th), a number of males of *Enallagma cyathigerum* were flying over grass, and one of them was seen to be carrying prey. It was captured, but was unfortunately allowed to escape, although it left its victim behind it in the net. Mr. R. South was kind enough to examine the prey, and identified it as the Pyralid moth *Scoparia ambigua*. Another male of *E. cyathigerum* with prey was taken at the same place on June 18th; in this instance the dragonfly was feeding on the common little moth *Tortrix viridana*.

The capture of *Erythromma naidas*, *Ischnura elegans*, and *Enallagma cyathigerum* near Ruislip, Middlesex, on May 28th, may be recorded for the sake of the locality. For the same reason, also, we may mention the following species taken on the Grand Junction Canal in the Uxbridge district:—*Calopteryx splendens*, male and female (June 4th), *Pyrrhosoma nymphula* (June 4th), *Ischnura elegans* (June 4th and 11th), and *Agrion puella* (June 11th). On the later date named our captures of *I. elegans* included immature as well as mature specimens, and var. female *rufescens* was also taken. Many of the females had the abdomen smeared with mud, as though they had been ovipositing. A visit to Lechlade, Glos., on September 1st (H. J. Watts) resulted in the capture of *S. striolatum*, *Æ. grandis*, and *E. cyathigerum*.

58, Ranelagh Road, Ealing: April 13th, 1912.

NEW AND LITTLE-KNOWN BEES.

By T. D. A. COCKERELL.

Megachile aricensis, Friese.

Piura, Peru, March, 1911, and April 28th, 1911, at flowers of *Philibertella flava* (Meyer), Cockerell; two males collected by C. H. T. Townsend. New to Peru. The *Philibertella* was recorded somewhat doubtfully in Ann. Mag. Nat. Hist., August, 1911, p. 285; I sent the specimen to Dr. N. L. Britton, who expresses the opinion that my identification is correct.

Megachile philinca, sp. n.

♀. Length, 10 mm., rather slender; black, with the legs bright ferruginous, the under side of the abdomen also ferruginous, as also the extreme lateral margins of the dorsal segments, especially posteriorly; eyes brown; mandibles red, quadridentate, the teeth black; cheeks narrow, especially above; clypeus and supraclypeal area shining, with strong punctures; cheeks, base of mandibles, and sides of clypeus with white hair, that on clypeus directed inwards, the ends meeting in the middle; a few inconspicuous black hairs about upper part of clypeus and middle of face; hair of front and sides of face pale yellowish, of vertex and occiput black, a strong black tuft between the ocelli; antennæ black, the flagellum with the faintest reddish tinge beneath; mesothorax dullish, with strong scattered punctures, bordered all round (broadly in front) with dense orange tomentum, the greater part, however, apparently bare, but with thin black hair; scutellum with long black hair, but posteriorly, and on postscutellum it is very pale yellowish to white; hair on pleura, sides of prothorax and metathorax white, but a black tuft just beyond tubercles; tegulæ shining apricot colour; wings dusky hyaline, nervures dark fuscous; legs with white hair, pale orange on inner side of tarsi; abdomen above shining black, with strong green and purple tints, hind margins of the segments with entire but narrow pale yellowish hair-bands; ventral scopa white, black on last segment.

♂. Length about 8½ mm.; differing by the usual sexual characters; face densely covered with silky pale golden hair; black hairs of hind part of head above, and of scutellum, very long; mandibles very dark, nearly black; antennæ black, last joint not peculiar; a curious long pencil of black hair on lower part of cheeks; anterior coxæ unarmed; anterior femora rather broad and flat, anterior tarsi not modified; fifth and sixth abdominal segments with pale yellowish hair and longer black hair; sixth segment retracted, feebly emarginate.

Hab.—Piura, Peru, February, 1911; one female, three males taken from nest (C. H. T. Townsend, 1124). The cells are covered with leaves in the usual manner, and the whole has a diameter of about 8 mm. The bee has taken portions of small leaves, each showing a midrib. A neat little species, quite closely related (male) to *M. lenticula*, Vachal, but the latter is larger, with black legs, and a very long pale yellow beard on cheeks below, the cheeks of *philinca* having a very short white beard. The type of *philinca* is the female. I have sent a male *M. philinca* to the British Museum.

TRICHOCOLLETES, gen. nov.

Resembling *Paracolletes*, but the eyes clothed with very long hair; stigma rudimentary.

Type, *Trichocolletes venustus* (*Lamprocolletes venustus*, F. Smith).

A specimen from Victoria, Sept. 20th, 1901 (W. W. Froggatt,

67), was observed to agree with *L. venustus*, except that it was larger (length fully 12 mm.), and, to my astonishment, the eyes were covered with long hair. I wrote to Mr. G. Meade-Waldo, asking him to look at Smith's type, and received this reply:—"I have carefully examined *L. venustus*, Sm., and find the eyes are clothed with long pale hair! Smith's estimate of length ($4\frac{1}{2}$ l.) is not far out for the type specimen in its present position with abdomen somewhat curved; I would suggest $11\frac{1}{2}$ mm. as a fair estimate of the total length, if the abdomen were straight." There is therefore no doubt that the specimen from Victoria is really *L. venustus*, which should, I think, form the type of a new genus.

Paracolletes turneri, Cockerell.

The known range is greatly extended by a specimen from Rutherglen, Victoria, 1909 (French; Froggatt collection, 86). Mr. Meade-Waldo has kindly examined the types of *P. turneri* and *P. elegans* (Sm.), and notes that in *P. turneri* the post-scutellum is armed medially with a small tooth-like process (so also in the specimen from Victoria), but in *P. elegans* the post-scutellum is shining, entirely impunctate, and bluntly sub-tuberculate.

Xenoglossa citrullina, sp. n.

♂. Length about 10 mm., antennæ about 7; black, head and thorax with very pale grey hair, vertex with some long fuscous hairs curving over ocelli, middle of scutellum and hind part of disc of mesothorax with dark sooty hair; nearly the lower half of clypeus yellow, the upper edge of the yellow angled in middle; labrum yellow; mandibles black, obscurely reddish toward apex; antennæ black, the flagellum very obscurely reddish beneath, its apical half strongly crenulated; maxillary palpi five-jointed, the last four joints measuring in μ (2.) 192, (3.) 192, (4.) 65, (5.) 110; paraglossæ extending beyond blade of maxilla, and the latter a little beyond end of second joint of labial palpi; last joint of labial palpi broad and obliquely truncate at end; tongue extending about 1088μ beyond paraglossæ; mesothorax dullish, with evident shallow punctures; tegulæ rufopiceous, with some dark sooty hair; wings moderately dusky; b. n. falling short of t. m.; small joints of tarsi ferruginous; hair on inner side of tarsi bright fox-red; abdomen very distinctly punctured; second segment with a pale basal hair-band, evanescent in middle; segments three to five with dense subapical bands of very pale yellowish-grey tomentum; sixth with redder hair, which covers apical margin; apical plate ferruginous, broadly truncate; no lateral spines.

Hab.—Piura, Peru, at flowers of water-melon, May (C. H. T. Townsend). It had previously visited an Asclepiad, as shown by two pollen-masses on the legs. This is related to the North American *Xenoglossa pruinosa*, Say, but differs in the maxillary palpi, which rather resemble those of *Tetralonia leucocephala*, Bertoni and Schrottky. The subapical hair-band, conspicuous

on the second abdominal segment of *X. pruinosa*, is wholly absent in *X. citrullina*, which also has the antennæ unusually long for a *Xenoglossa*.

Boulder, Colorado: March 8th, 1912.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S., &c.

(Continued from p. 155.)

JUNE 12th was fine and hot, and I spent most of the day in the woods, but did not secure anything of note. *Parasemia* (*Nemophila*) *plantaginis* was kicked up in small numbers: also *Euclidia glyphica*, *E. mi*, and *Haplotis fasciana* (*Erastria fuscata*). The leaves of the butter-bur had been riddled by the larvæ of *Acipitia galactodactyla*, but although I turned over scores of them I only found two pupæ. Among St. John's wort the pretty little *Catoptria hypericana* was flying in some numbers, and the larvæ of *Depressaria hypericella* were plentiful in screwed-up leaves and terminal shoots. The first *T. costana* was bred to-day from the pupæ and larvæ taken on the 8th.

The 13th and 14th were rather cool days with occasional showers. On the 13th I beat some fine fresh *Endopisa nebriana* from sloe and bramble; on the 14th more pupæ and larvæ of *T. costana* were found, and *Melanthia procellata* was beaten from wild clematis; on the 15th I returned to Dovercourt. On the 17th there had been some rain during the night, followed by a warm bright day with a fresh south-westerly breeze. I visited the woods in the evening and tried sugar; it was (apparently) a very favourable night, but only one moth was attracted, a large and very dark—almost black—*Palinpestis* (*Cymatophora*) *duplaris*. I had hoped that the previous night's rain would have washed off most of the honeydew, but it had not. Very few things were flying at dusk, the only thing netted being *Noctua festiva*. Several *Hypona proboscidalis* were bred. On the 18th *Acidalia marginipuncta* was bred from a brood of larvæ I got through the winter; one larva was still feeding. A very dark, almost black, variety of *T. costana* was bred from Castor pupæ; it is a very pretty insect—I have not seen one like it before. The 20th was fine, with heavy showers in the middle of the day; warm south-westerly breeze. In a marshy field, below a small wood, where there were some ditches overgrown with reeds, I tied several reeds together and sugared them. Moths came in abundance, and among others were the following:—*Leucania obsoleta* (one, rather worn); *L. comma*, *Apamea basilinea*, *Hadena dentina*, *H. suasa*, *Euplexia lucipara*, *Noctua augur*, *Triphæna*

pronuba, *Agrotis exclamationis*, *A. gemina*, *Miana fasciuncula*, *M. strigilis*, and *H. oleracea*, were abundant. Several fresh *Leucania pallens* were sitting on the reeds drying their wings. In the forenoon I took a fresh *Trochilium apiformis* on a poplar-tree. On the 21st I sugared in another locality—a dark warm night with no dew or moon. Moths were abundant, from sixteen to twenty on every patch of sugar; all those species seen the previous night were present, with the exception of *L. obsoleta* and *H. dentina*, and, in addition, I boxed five *L. favicolor* (an insect I had not seen for several years), *Agrotis ripæ* (already worn), *Manestra sordida* (anceps), *L. impura*, *Mania typica*, *Caradrina morpheus*, *N. c-nigrum*, and *Acronycta psi*, or *tridens*; the latter were abundant. The 23rd was fine and warm until 4 p.m., when a drizzly rain set in until 7 o'clock, then it cleared for a short time. In the forenoon I took one *T. apiformis* from poplar, and several *Hedya neglectana*. In the evening I armed myself with an umbrella and went to the lanes, &c., "sugaring." Fine rain came on again, and by 10 o'clock it had increased to a regular downpour. However, moths were quite numerous, and I got five more *L. favicolor*, and saw all the species noted on the 21st, with the addition of *Xylophasia lithoxylea*, *Aplecta adrena*, and *Axyia putris*. On the 26th I bred *Melanthia albicillata*, and beat about three dozen larvæ of *Anticlea badiata*, most of them full grown. Larvæ of *Malacosoma neustria* were now abundant. When at Castor I obtained a batch of ova of *Ematurga atomaria*, which began to hatch on the 27th. I supplied them with white clover, *Lotus corniculatus*, and knotgrass; they nibbled at each, but finally settled down to the knotgrass, at which I was pleased, as this is the easiest plant of the three to keep fresh. (They eventually became full-grown, and very pretty larvæ they were; I thought the moths would emerge in the late summer, but they did not do so.) I went to the woods in the forenoon on the 27th, but the weather was rather dull, and insects were not moving. I got another *T. apiformis* and one *Crambus pinetellus*, which is rather uncommon here. I sugared in the lanes, &c., in the evening, and there were plenty of visitors on each patch; I boxed three *L. favicolor*, and, in addition to the species already seen, noticed *Acronycta megacephala*, *L. lithargyria*, and *N. plecta*. The 28th was fine and bright in the morning, but clouded over during the afternoon, with warm light north-westerly breezes. In the woods, notwithstanding the warm dark night, very few moths were flying, and only seven visited the sugar, *Palimpsestis* (*Cymatophora*) or being the best. The 29th was dull and warm. I took a pair of *T. apiformis* in cop, high up on a poplar at 9 a.m. The female laid a quantity of little round, shining, chocolate-coloured eggs, with apparently no adhesive matter attached to them, as they rolled loosely about in the box. I wonder where

the eggs are placed by this female? Probably in the old larva-holes, or scattered at random at the base of the tree. *Hadena trifolii* (*chenopodii*) and *Pseudoterpna pruinata* (*cytisaria*) were now emerging in breeding-cages. The 30th was another dull warm day. *Thecla quercus* and *Triphena ianthina* were bred.

On July 1st we had sun and cloud, light westerly breezes, and it was very warm. Posts, &c., near the sea, were sugared. It seemed to be a favourable night, but moths were few and far between. Among those seen or taken were two *Leucania favicolor* and six or seven *Agrotis ripæ*, all much worn; *Mamestra abjecta*, two very fine, the first this year; and I was sorry to see *X. polyodon*, as I knew this species would probably be a pest in a few days. A couple of *Crambus salinellus* were netted at dusk. The 4th was fine and bright, and very warm. Two more *Trochilium apiformis* were taken off poplars after breakfast. In the evening I sugared on the marshes; moths were not very numerous, but *L. conigera* and *M. albicolon* were observed for the first time. At dusk eight *C. salinellus*, all males, were netted, together with *Lithosia complana* and *Acidalia emutaria*. The 5th was another hot day. Some *T. interjecta* were bred. One of the female *L. favicolor* taken on June 21st had laid a few eggs, and they began to hatch to-day.

The 6th was fine, bright, and very hot, the warmest day we have yet had. I went to the salterns to see if I could get any full-grown larvæ of *Malacosoma castrensis*, but in consequence of the dry weather and scarcity of grass I found the farmers had turned their cattle out there; everything had been cropped close to the ground, and there was hardly an insect to be seen. There were no signs of *castrensis* larvæ. I was perhaps a bit too late for them. All I got was one specimen of *A. emutaria* and half a dozen *Tortrix viburniana*. On the way back I noticed a quantity of chamomile growing at the edge of a cornfield, and upon sweeping it with my net obtained seven small larvæ of *Cucullia chamomille* and a number of *Eupithecia oblongata*. *Epinephele tithonus* was just appearing.

The 7th was fine and very hot. A large female *Zeuzera æsculi* was brought to me by a boy; *C. asteris*, *E. subnotata*, and *T. fimbria* appeared in breeding-cages. In the evening I went to the marshes, to work along the reeds. There was a light easterly breeze; a heavy dew and a ground-fog began to rise, and it became quite cool, which stopped the flight. I only got *Comacla* (*Nudaria*) *senex*, *Chilo phragmitellus*, and *Acidalia emarginata* (the latter had been abundant in some places), so I left the marshes and went homewards. When I reached the higher ground I lost the fog and it became much warmer, and common insects such as *Timandra amatoria*, *Camptogramma bilineata*, *Cidaria dotata*, *Hypena proboscidalis*, &c., were flying in great numbers.

(To be continued.)

NOTES AND OBSERVATIONS.

A NEW GENERIC NAME IN THE HEMITHEINÆ.—I regret that by an unaccountable oversight I overlooked the name *Orthocraspeda* in Hampson's *Fauna of British India: Moths*, 1, p. 393, and have employed the same name again in my recent revision of the Geometrid subfamily Hemitheinæ (Gen. Ins. fasc. 129, p. 28, 1912). For *Orthocraspeda*, Prout, nec Hampson (type *netunaria*, Guen.) I therefore propose the new name of *Orthorisma*.—LOUIS B. PROUT; 62, Graham Road, N.E., May 3rd, 1912.

PLUSIA MONETA.—Is it known how *P. moneta* passes the winter? I am inclined to think that the egg is laid on the seed of the plant while in the pod. For this reason: last autumn I bought some new flower-pots from a brick-yard, not from a nurseryman, one of which I filled with earth from a meadow far from any possible *Delphinium* or monkshood, and in it planted some seeds of *Delphinium* bought from a seedsman. This pot was kept in a greenhouse through the winter, in which there were not and had not been any other *Delphinium* plants. When my seedlings were about an inch and a half high, there, curled up among them, was a small *P. moneta* larva. How did it get there? The only possible way seems to be that it was among the seed, either as ovum or larva, and all things considered it does not seem feasible that it could have survived if it was in the larval stage. Hence I conclude that the egg is attached to a seed and so passes the winter.—W. CLAXTON; Navestock Vicarage, Romford.

GYNANDROUS EUCHLOE CARDAMINES.—It may be of interest to record the capture of a gynandrous specimen of *E. cardamines* at Oxshott, on May 12th. The left side is female and the right side male. The orange has a splash of white through it on both upper and under side of the wing. There is also a black streak radiating from the tip of the wing towards the centre.—D. S. WILLIAMS; 77, Durham Road, East Finchley, N., May 13th, 1912.

BREPHOS PARTHENIAS, ab.—On March 23rd, 1912, I took, on Wimbledon Common, several *B. parthenias*, all in very fine condition; one of these has the whole ground colour of the hind wings pure yellow, with the usual blackish markings. Seeing that you state that this form of *B. parthenias* is rare ('Moths of the British Isles,' Series ii. p. 98), I thought it might be well to record the capture.—W. SAVILLE; 16, Mincing Lane, E.C., April 25th, 1912.

DRYMONIA CHAONIA, ab.—On the evening of May 7th I took a specimen of *D. chaonia* on a street lamp. It is without the usual white band, and of a uniform dark sooty colour.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere.

COLIAS EDUSA AT REIGATE.—A specimen of *C. edusa* was flying in my garden this morning (May 12th) at 10 a.m. It went straight across in the usual manner of the species. I have heard of another specimen being seen.—T. A. CHAPMAN; "Betula," Reigate, May 16th, 1912.

COLIAS EDUSA IN THE ISLE OF WIGHT.—I am glad to record the capture of a perfectly fresh female *C. edusa*, which I took on Culver Cliffs at Sandown to-day (May 14th). There does not appear to be any record of this species having been taken before, in the spring, in any part of the Isle of Wight.—STANLEY A. BLENKARN, F.E.S.; "Teneriffe," Sandown, 1912.

EUCHLOË CARDAMINES IN APRIL.—Dr. R. N. Goodman (Kingston) informs me that he saw a specimen of *E. cardamines* on April 13th last. I may add that I saw a specimen of this butterfly at Claygate Coverts on April 24th.—W. J. LUCAS.

LYCÆNOPSIS (CYANIRIS) ARGIOLUS, Linn., IN APRIL.—It is interesting to note that this species, which was first observed here in 1899, seems firmly established, as to-day I have seen several freshly emerged specimens flying in the sunshine. By this early date of appearance there can be no doubt that they have hibernated in the pupal stage.—HAMILTON H. DRUCE; The Beeches, Circus Road, London, N.W., April 18th, 1912.

I took a specimen of *argiolus* in my garden at Kelly College, on Good Friday, April 5th.—H. V. PLUM; Kelly College, Tavistock, May 8th, 1912.

PYRAMEIS ATALANTA AND P. CARDUI AT DOVER.—A pupil (J. P. Restall) informs me that *P. atalanta* and *P. cardui* are swarming at Dover. I may add that I saw a specimen of the last-named species at Claygate on May 12th last.—E. A. C. STOWELL, Kingston Grammar School, Kingston-on-Thames, May 17th, 1912.

PYRAMEIS ATALANTA AT HASLEMERE.—On May 12th I saw a fine specimen of *P. atalanta* flying about a bed of nettles. It appeared to be in good condition.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere.

PYRAMEIS ATALANTA AND P. CARDUI IN ISLE OF WIGHT.—*P. cardui* was common at Sandown on May 14th, and the specimens were in fine condition. One very fresh specimen of *P. atalanta* was noted.—STANLEY A. BLENKARN; "Norham," Cromwell Road, Beckenham.

PYRAMEIS CARDUI AND NOMOPHILA NOCTUELLA AT KEW.—In Kew Gardens, on May 14th, I saw two specimens, both seen at once, of *P. cardui*; also one example of *N. noctuella*, clearly pointing to a spring immigration.—T. A. CHAPMAN; "Betula," Reigate.

PYRAMEIS CARDUI IN NORFOLK.—On May 14th last I captured in Roughton Rectory Garden, near Cromer, a specimen of *P. cardui*. It was not at all worn.—L. W. ROBINSON; Roughton Rectory, Norwich.

MANDUCA (ACHERONTIA) ATROPOS IN SALOP.—A specimen of *M. atropos* was brought to me, on May 15th, by a working man in Shifnal. The moth had entered one of his hives and driven every bee out, queen included. I note that *Macroglossa stellatarum* is also about. These facts point to a migrant year. A full-grown larva of *Gastropacha quercifolia* was sent to me from a garden in Welford-on-Avon.—L. T. BURT; Buckley Estate Office, near Shifnal, Salop.

PHRYXUS (DEILEPHILA) LIVORNICA AT DOVER.—I am pleased to record the capture of *P. livornica* on May 17th, 1912, on the Admiralty Pier, Dover, by a Mr. E. King. It is now in my possession.—F. P. ABBOTT; 8, Beaconsfield Road, Dover, May, 1912.

PHRYXUS LIVORNICA, MANDUCA ATROPOS, AND HELIOTHIS PELTIGERA IN CORNWALL.—I have to record, between May 9th and 17th, the capture of fifteen *P. livornica*, one *M. atropos* (female); also one *H. peltigera*, taken at light in South Cornwall.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey.

SPHINX LIGUSTRI IN MAY.—A specimen of *S. ligustri* was captured on May 16th last at Hampton Wick.—E. A. C. STOWELL.

CERURA BIFIDA IN MAY.—At 5 p.m. on May 1st I found a newly emerged specimen of *C. bifida*, near the foot of a poplar-tree.—E. A. C. STOWELL.

POLYPLOCA FLAVICORNIS IN FEBRUARY.—On February 25th, between 11 and 12 a.m., I saw three specimens of *P. flavicornis* at Oxshott. They were drying their wings and sitting about a foot from the ground.—E. A. C. STOWELL.

TEPHROSIA PUNCTULARIA IN MARCH.—I can give an earlier date for *T. punctularia* than April 4th, mentioned by Mr. Dolton (*antea*, p. 157), as I found the species on palings at Esher on March 30th last.—E. A. C. STOWELL; Kingston Grammar School, Kingston-on-Thames.

LEPIDOPTERA AT LIGHT IN EARLY MAY.—The following records may be interesting as illustrating the abnormal early emergence of some insects this spring. After the long period of continuous easterly wind, a change took place on May 1st, and that evening the wind blew gently from the westward. Thinking I might obtain a few moths around the several street lamps in the neighbourhood, I went to see; not a specimen of any sort was about, although weather conditions appeared suitable. However, on the 3rd inst.—only two evenings later—around the same lamps I secured, in the course of an hour, one *Stauropus fagi*, *Notodonta trepida* (6), *Pheosia dictæoides* (1), and *Drymonia chaonia* (1), as well as seeing plenty of commoner species. During the following two nights I took several *N. trepida*, and one or more specimens of *P. dictæa*, *D. chaonia*, *Demas coryli*, *Panolis piniperda*, *Eustronia silaceata*, *Selenia tetralunaria*, one *Lobophora viretata*, and one *Anticlea nigrofasciaria*. The sudden emergence of Lepidoptera after the period of east winds struck me as being rather remarkable.—BERTRAM E. JUPP; Lyn Lodge, Camelsdale, Haslemere, May 8th, 1912.

EARLY EMERGENCE OF LEPIDOPTERA.—It may be of interest to record the following early emergences:—April 20th, *Demas coryli*; May 4th, *Agrotis cinerea*; May 5th, *Dianthæcia cucubali*. The above all came to light at Warlingham. This afternoon (May 11th) I noticed *Macroglossa stellatarum* flying round the blossoms of *Iris florentina*.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey.

DASYCAMPA RUBIGINEA AT CHRISTCHURCH.—On March 17th, when searching willow-bloom in the Christchurch district, I found a female

D. rubiginea at rest on a twig of nut, some distance away from the nearest sallow. It laid over two hundred eggs, and later I had nearly one hundred larvæ feeding. — E. PIAZZA; 11, St. Philip's Road, Surbiton.

BLATELLA GERMANICA (ORTHOPTERA).—A specimen was found in Walker's Brewery, Warrington, on September 18th, 1911. It is now in the Warrington Municipal Museum.—W. J. LUCAS; 28, Knight's Park, Kingston-on-Thames.

NOTES ON LEPIDOPTERA FROM THE ISLE OF WIGHT.—*Vanessa io*, worn; *Pararge megara*, common; *V. urticae*, a few specimens; *Plusia gamma*, a few in good condition; larvæ of *Euproctis chrysorrhæa*, very abundant on the cliffs, where it was rare last year; whilst *Abrazas grossulariata*, larvæ of which swarmed last year, is almost non-existent this year.—STANLEY A. BLENKARN, F.E.S.; "Teneriffe," Sandown, May 14th, 1912.

WEST SURREY LEPIDOPTERA.—Mr. H. O. Holford's record in the last number of the 'Entomologist' (*ante*, p. 157) enables me to supply some additional information concerning the Lepidoptera of West Surrey. In the early seventies my friend Mr. John Evershed, Junr., now of the Kodiakanal Observatory in India, frequently collected with me in the neighbourhood of Woneresh, near Shalford, where his family then resided. One season (the exact year has unfortunately escaped my memory), we took at sugar quite a large number of *Calymnia pyralina*, my series being still in my collection, as I have never taken the species since. We were neither of us very greedy for numbers of specimens, and we only took a small portion of the number seen on the sugar patches. That same year *Xylophasma scolopacina* was quite abundant at sugar in the same district. At sallow, near Bramley, in the spring of that year, among the usual species, one specimen of *T. leucographa* was taken, this being, so far as I have been enabled to ascertain, the first Surrey record for this species.—R. MELDOLA; 6, Brunswick Square, W.C., May 3rd, 1912.

LAPHYGMA EXIGUA IN SOUTH WALES.—With my friend Mr. G. D. Hancock I spent last week in South Wales, in a vain search for larvæ of *X. conformis*. We were lucky enough, however, to find a good locality for *L. exigua*, of which we took eleven specimens in two nights, some on the wing, others at sugar. I see that Barrett states that the imago hibernates, and I have always understood that the specimens taken in the spring in this country are supposed to be immigrants. Judging, however, from the condition of those which we secured, I feel sure they were recently emerged and had bred where we found them. I always believed, too, that *L. exigua* liked a strong wind, and did not come to sugar till 11 p.m. or later. The two nights on which we took it were, however, warm and still. I took one insect on the wing at 8.30; the flight seemed to be over by 9 o'clock, and we were never out after 10 p.m.—PERCY C. REID; Feering Bury, Kelvedon, May 16th, 1912.

CORRECTION.—In the 'Entomologist,' vol. xlv. p. 285 (1911), Mr. E. R. Speyer recorded the dimensions, as ascertained by myself,

of an unusually small specimen of *Pyrrhosoma nymphula* taken by him near Tunbridge Wells on August 1st, 1909. The measurements themselves are correctly quoted, but they relate to a male and not to a female example, as stated by Mr. Speyer.—H. C.

COLLECTING IN WESTMORLAND, 1911.—On June 4th we spent a pleasant morning amongst the butterflies, and netted a grand series of *Lycæna agestis* (male) in bred condition. The abnormal heat of May had hastened emergence, and both *Argynnis euphrosyne* and *Nemeobius lucina* were worn. A somewhat surprising capture in the same locality (dry limestone formation) was half-a-dozen *A. selene* in none too fresh condition. In this neighbourhood we generally look for *A. selene* towards the end of June, or even early July, and then only on the marshy hillsides. A couple of *Parasemia plantaginis* (early) and several *Prothymna viridaria* completed the bag. Several hours beating of oak on the 5th produced only two full-fed larvæ of *T. quercus*. All foliage was unusually forward, and larvæ were greatly in advance of the average season. A couple of half-grown larvæ of *N. chaonia* fell into the tray, but both died after spinning up.

The evening of June 8th, with a bright cloudless sky, saw *P. plantaginis* flying in numbers. From 6.30 p.m. to 9 p.m., when the sun left the hillside, they dashed madly across the heather and bracken, never attempting to "settle." The effort needed to overtake and net even a few brought us quickly to a state of exhaustion. Generally, in an afternoon, and especially if the sky is overcast, *P. plantaginis*, when disturbed, will fly perhaps fifty yards and then drop, when it may, with caution, be successfully stalked; but this particular evening was quite evidently their "night-out"! The var. *hospita* is unmistakable on the wing, but several taken, even at this early date, were so far worn as to be hardly worth setting. It was a matter of considerable regret that other arrangements prevented me from following up this handsome species, but my friend, Mr. G. Holmes, was lucky enough to find a pair in cop. (male = *hospita*, female = type). From these he obtained a quantity of ova, and the resulting larvæ were fed on broad-leaved plantain. A good proportion fed up quickly, and during September and October he bred one typical male, ten var. *hospita*, and thirteen females, six of the latter being more or less crippled. *Hospita* is a lovely thing when bred. Two of them are noteworthy in having the black markings of the hind wing confined to the marginal area with the exception of a pair of short pencilled streaks at the base, which figuring gives the hind wings a strikingly white appearance. The same evening (8th) about 7 p.m. males of *Macrothylacia rubi* were flying low over the grass in search of females. Two of the latter sex were netted.

On June 11th I paid a visit to the "moss" in quest of *C. typhon*, and can confirm Mr. B. H. Crabtree's note (Entom. xlv. p. 319) on the early appearance of this insect. They were out in numbers, but many of the males and some females were looking very ragged. Judging by their condition, I can quite believe that *typhon* might have been taken on the 1st of the month. *Perconia strigillaria* and *Acidalia fumata* were abundant, and one newly emerged male *Diacrisia sanio* was taken. The same day a number of larvæ (about

half grown) of *Triphosa dubitata* were found on the under sides of buckthorn leaves. This larva has a habit of resting in a curved position, with the head touching the eleventh segment. — FRANK LITTLEWOOD.

(To be continued.)

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 20th, 1912.*—Rev. F. D. Morico, M.A., President, in the Chair.—The following gentlemen were elected Fellows of the Society:—Messrs. T. W. Allen, M.A., 30, Blenheim Gardens, Cricklewood, N.W.; Edward Stuart Augustine Baynes, 120, Warwick Street, Eccleston Square, S.W.; Gerald Bedford, Entomologist to the Union of South Africa, Department of Veterinary Science, Churchfelles, Horley, and Ondestopoot, Transvaal; Capt. Kenneth Alan Crawford Doig, R.A.M.C., M.R.C.S., F.R.C.P., Villa Sorrento, York Road, Woking; Messrs. Herbert L. Earl, 35, Leicester Street, Southport, Lancs; C. Jemmett, Ashford, Kent, and South-Eastern Agricultural College, Wye, Kent; R. D'A. Morrell, Authors' Club, 1, Whitehall Court, S.W.; Charles A. Schunck, Ewelme, Wallingford.—The death was announced of Mr. H. J. Adams, of Roseneath, Enfield.—Commander J. J. Walker exhibited specimens of *Claviger longicornis*, Müll. (with *C. testaceus*, Preyssl., for comparison), a species of Coleoptera new to the British list. They were taken under stones near Kirtlington, Oxfordshire, in May, 1906, and April, 1907, in nests of small yellow and black ants of a species not determined, but suggested by Mr. Donisthorpe to be *Lasius umbratus*.—Mr. Donisthorpe exhibited specimens of *Microdon mutabilis* bred in his observation nest of *Formica fusca* from Porlock, also the nest itself with the ants and a live larva of *Microdon* taken at Porlock, April 27th, 1911, and pupa-cases and larvæ of the fly in spirit. Mr. W. C. Crawley said that he had found one larva in a nest of *Myrmica ruginodis* instead of the usual host *Formica fusca*.—Professor Poulton exhibited the insects in the following list; all the specimens had been captured in forests within a few miles of Entebbe, between May 23rd and July 25th, 1909:—*Neptidopsis ophione*, Cram., *Neptis melicerta*, Drury, *N. agatha*, Stoll, *N. metella*, Dbl., Hew., *N. nicomedes*, Hew., var. *quintilla*, Mab., *N. nemetes*, Hew., *N. saclava*, Boisd., *N. nysiades*, Hew., ab. *continuata*, Holl., *N. puella*, Auriv., *Deilemema leuconoe*, Hopff., *D. transitella*, Strand.—Professor Poulton exhibited the male and female types of *Neptis swynnertonii*, a new species from S.E. Rhodesia, described by Mr. Roland Trimen, F.R.S., together with a specimen captured in the garden at Chirinda (3800 ft.) on March 28th, 1911, by Mr. C. F. M. Swynnerton.—Professor Poulton exhibited *T. formosa*, Godman, and its mimic, *Papilio rex*, Oberth., from the Kikuyu Escarpment, near Nairobi, British East Africa; the same Danaine, and the transitional *Papilio commixta*, Auriv., from Nyangori, at the north-east corner of the Victoria Nyanza; *T. mercedonia*, Karsch, and *Papilio mimeticus*, Rothsch., from Buddu on the west shore of the lake; and *T. morgeni*, Honrath, with three of its *Amauris* models—*psyttaea*, Plötz, *hecate*, Butler,

and an undetermined species, probably new, from the Cameroons.—Professor Poulton exhibited the three largest Lycænidae captured by Mr. W. A. Lamborn, and suggested that an undetermined pupa in the nest of *Cecophylla* might possibly belong to one of them. He pointed out, however, that all three were placed among the Lipteninae, while the problematical pupa bore much resemblance to a smaller one which produced an imago belonging to the Lycæninae. The three large species were *Epitola honorius*, F., male and female, *E. posthumus*, F., male, and *Hewitsonia boisduvali*, Hew., male and female. Mr. Lamborn's notes on the two females showed a remarkable degree of sluggishness.—Professor Poulton exhibited a male *Amauris egialea*, Cram., recently received from Mr. W. A. Lamborn. The "paper" enclosing the specimen bore the following note:—"8 a.m. Half mile [from Oni clearing]; Jan. 30th, 1912. Observed flying up and down. It then settled on upper surface of leaf and started to pass its brushes to and fro over its scent-patches, exactly as *Amauris niavius* did. Wings were rather over-flexed." Dr. F. A. Dixey and Professor Kellogg, of California, commented on this exhibit.—GEORGE WHEELER, M.A., *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 8th*, 1912.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. R. Adkin exhibited an aberration of *Pyrameis atalanta* with a flesh-coloured band on the fore wing.—Mr. Newman, a series of *Ephyra annulata* var. *obsoleta*, in which the discoidal rings on the fore wings were absent.—Messrs. Mitford, Edwards, Coxhead, and West (Ashted), exhibited slides under the microscope.

February 22nd.—The President in the chair.—Mr. Andrews, a number of species of the Trypetidae family of the Diptera, all from Milford Haven.—Mr. Turner, a dwarf example of *Colias edusa* from near Villeneuve, measuring 32 mm. in expanse.—Mr. Sheldon, the Brentids he took last year in Lapland, *B. frigga*, *B. frigea*, *B. polaris*, &c., and gave full notes on their characteristics and habits.

March 28th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. C. F. Lloyd, of Ashford Common, Middlesex, was elected a member.—Mr. B. H. Smith exhibited ova of *Amphidasys strataria* laid by a female with which he had assembled five males.—Mr. West, the specimen of *Psylla albipes* found by him at Box Hill in October last, and new to the British list of Hemiptera.—Mr. Newman, living examples of *Melitæa aurinia*, bred at a temperature of sixty to seventy degrees, and full-fed larvæ of *Dryas paphia* fed under similar conditions. He called attention to the extreme scarcity of larvæ of *Arctia caia* and of *Abraxas grossulariata*. Mr. W. G. Sheldon, specimen of *Leptosia sinapis* and *L. duponcheli*, with the summer broods of the same, var. *dimensis* and var. *æstiva* respectively, and pointed out that the British summer form of the former species was an intermediate form.—Mr. R. Adkin, a specimen of *Hadena porphyrea* (*satura*), and read a series of historical and critical notes on the species.—Mr. Andrews, the Syrphid *S. arcticus*, taken at Chattenden on March 12th.—Mr. Ashdown, a specimen of *Mysia oblongo-guttata* ab. *nigro-guttata*, from Oxshott, in May, 1911, and recently described as new.—Mr. Sich, for Mr. G. B. Routledge, a

melanic example of *Depressaria aplanata*, from Carlisle.—Mr. A. E. Tonge, a living specimen of *Callophrys avis*, bred *ab ovo*.—Mr. Edwards, examples of the closely allied Ornithoptera *O. lydius* and *O. croesus*.—Mr. H. Main, the larva of the alder-fly, *Sialis lutaria*.—H. J. TURNER, *Hon. Report. Secretary*.

RECENT LITERATURE.

Butterfly-Hunting in Many Lands: Notes of a Field Naturalist.
By GEORGE B. LONGSTAFF, M.A., M.D., F.R.C.P., F.G.S., &c.
To which are added Translations of Papers by FRITZ MULLER
on the Scent-organs of Butterflies and Moths: with a Note by
E. B. POULTON, D.Sc., F.R.S. Pp.-xviii, 1-728. Plates i-xvi
(seven coloured). London: Longmans, Green, & Co. 1912.

OF the ten chapters into which this handsome volume is divided, the first, entitled "Some Early Reminiscences," treats mainly of the author's field-work in various British localities. Among other interesting captures mentioned in this section we note—eighteen larvæ of *Orgyia gonostigma* on Wimbledon Common (1864); *Anticlea rubidata*, Wimbledon Common (1865); *Leucophasia sinapis*, Lyndhurst (1865); *Boarmia abietaria*, Rugby (1866 or 7); and *Macaria notata*, Combe Wood (1867).

In chapters ii-ix the author's impressions of the countries he travelled through, and the entomological observations he made therein, are chronicled in narrative form. Not only as regards butterflies, but every insect that presented itself to his notice seems to have been annexed, accurately identified, and its name entered in these interesting accounts of the author's wanderings in many lands. India and Ceylon were visited in 1903-4; China, Japan, and Canada in 1904; Algeria in 1905; South Africa in 1905; West Indies and South America in 1906-7; and New Zealand and Australia in 1910.

Under the heading "Butterfly Bionomics" (chapter x, pp. 489-600) are brought together valuable notes on several exceedingly interesting subjects such as Scents, Tenacity of Life, Successful Mimicry, Peculiarities of Life, Attitudes at Rest, Seasonal Forms, &c.

A series of papers on scent-organs in Lepidoptera (twelve in number) by the distinguished naturalist Fritz Muller, who died in 1897, form the Appendix (pp. 601-666). These papers, some written in German, others in Portuguese, have been ably translated by Mr. Ernest A. Elliott, and English students will be grateful to him, as well as to Dr. Longstaff, for their publication in the present volume. The Appendix, which is prefaced by an introductory note written by Professor Poulton, D.Sc., F.R.S., is illustrated by nine plates.

We can heartily commend this capital volume of travel and entomology. It is readable from cover to cover, highly interesting throughout, and very instructive. If we were disposed to cavil at aught, we might take exception to the title, which does not appear to present an adequate conception of the contents of the book.

The six excellent coloured plates, drawn by Messrs. Horace and Edgar S. Knight, represent some forty-eight species belonging to various Orders, and include twenty-two novelties.

THE ENTOMOLOGIST

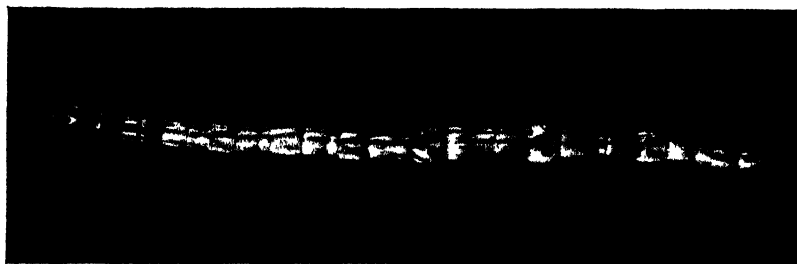
VOL. XLV.]

JULY, 1912.

[No. 590

THE LARVA OF *CARDIOPHORUS ASELLUS* (COLEOPTERA, FAM. ELATERIDÆ).

BY DAVID SHARP, M.B., F.R.S., F.E.S., &c.



At the beginning of this month I had the pleasure of meeting with this extraordinary larva near Bournemouth. I have for many years wished to see this larva, not only because of its peculiarity, but because some of the points in the literature about it are vague and obscure. Although the genus *Cardiophorus* abounds in species, some of which are very abundant in Continental Europe, yet the larva is so seldom met with that M. Henri du Buysson, who has devoted many years to the study of the European Elateridæ, has never seen it; and in his work ('Faune gallo-rhenane Elateridæ') recently completed has been obliged to content himself with a summary of the observations of Schiödte and Perris, who are apparently the only naturalists who have described this larva from personal knowledge.

When I obtained it I thought it desirable to obtain a photograph before it underwent *post-mortem* changes in form, and my friend Mr. G. T. Lyle has been so good and so skilful as to produce a likeness that gives an excellent idea of the form and of some of the peculiarities of the creature, for which we owe him our best thanks.

When alive the larva is totally dissimilar in its movements from other Elaterid larvæ, being very quick and agile. The posterior part of the elongate body trails behind, and when it moves forward does so with a sort of peristaltic movement. But

the anterior parts are quite different in action; they are held raised a little from the ground, and moved about quickly from side to side; the head moves the most freely, and the mouth-parts are kept in constant and rapid vibration, like the tongue of a snake; the movements indeed are singularly reptilian, as well as the form of the creature.

As regards the extraordinary segmentation, we may remark that at first sight there appear to be: head + 4 thoracic + 23 abdominal segments. A careful examination reduces the number of segments to that normal for coleopterous larvæ. What appears in the photograph to be the head is really the prognathous mouth-pieces, which are separated from the rest of the head (*i. e.* the elongated part that immediately follows) by a transverse division that extends completely round. The head, in fact, is excessively elongate, and may be described as pseudo-bisegmental. The first thoracic segment is hard and of a brown colour like the head; all the following parts are pale and soft. In length the three thoracic segments are subequal; and the first is connected with the head, the third with the first abdominal, and the three one with the other, by means of intersegmental membranes that do not differ greatly from the intersegmental membranes of ordinary Elaterid larvæ except by being somewhat longer and more exposed than usual. The apparently increased number of abdominal segments is due to great elongation and exposure of the intersegmental membranes. The number is made up thus: first abdominal segment consists of two divisions, segments 2-7 consist each of three divisions, segment 8 of two divisions, and segment 9 is single; thus making up twenty-three, the pseudo-segmental number. The true tenth abdominal segment is concealed in a dorsal view by being placed under the ninth. When the larva is alive there is a slight difference in colour and texture between the supernumerary divisions and the others, that confirms the interpretation of the abdominal structure I have just given.

The larva was found by Mr. A. Ford, of Bournemouth, and myself side by side with specimens of *Cardiophorus asellus* (of British collections). No other *Cardiophorus* is known to occur at Bournemouth, so that the connection of the larva and imago is not open to doubt. I mention this because the larva described and figured by Schiödte in his well-known work is said to be that of *C. asellus*. If so, his figure is far from successful, and I believe it really pertains to a species different from that I have described. Perris's figure (204, 'Larves de Coléoptères') is said to be *C. rufipes*: this figure gives a better general idea of our larva than does that of Schiödte, which is far too broad and robust.

The peculiarities of the larva of *Cardiophorus* are far from being confined to its segmentation. But a consideration of them

would involve comparisons and discussions that would extend far beyond the limits of an article in the 'Entomologist.'

I may mention that the larva was found in the purest and driest of fine sea-sand. It was brought home in a tin containing some of the sand; this was wetted and so made more solid, and the larva evidently appreciated this, and burrowed in the wet sand. I did not keep it long alive, as I feared it might change to a pupa. I have no doubt that it is carnivorous and predaceous.

Brockenhurst: May 28th, 1912.

NOTES ON THE BRITISH MOSQUITOS (CULICINÆ).

By F. W. EDWARDS, B.A., F.E.S.

(Published by Permission of the Trustees of the British Museum.)

CONSIDERING the great interest now taken in the blood-sucking gnats or "mosquitos," their economic importance in relation to disease, the large number of workers engaged in their study, and the enormous output of literature concerning them, it is somewhat remarkable that so little has been written about the British species. Indeed, the only attempt at a general systematic account of them (apart from the treatment in Walker's 'Insecta Britannica, Diptera' [1856]), so far as I am aware, is that of Stevens, published in 1825. Needless to say, these are hopelessly out of date, and the descriptions are so meagre that it is impossible to recognize to what insects they are intended to apply. Thus their determination is a matter of needless difficulty. It is true that good descriptions of most of the species are to be found in Theobald's 'Monograph of the Culicidæ of the World,' but these have to be picked out of an enormous mass of material, while the keys to the genera and species which the author gives are in many cases difficult of application and not of much value; to say nothing of the fact that his system of classification is not accepted by other entomologists who have studied these insects, and by dipterists in general. This being the state of affairs, it seems as though it would be of use to give a concise synopsis of the British species, taking into account the most recent researches. It is hoped that the following tables and notes will be found workable and helpful, and that they may be the means of inducing some to take up the study of these interesting insects during the present summer. There is much work yet to be done before our knowledge of them approaches completeness: the larvæ of several species are yet undiscovered, and it is probable that even the number of species on the British list is not yet complete. One species is introduced in the present

paper as new to our fauna, and others are very likely to occur if searched for.

The writer merely hopes in these notes to pave the way for further and more detailed work by enabling the collector to name his material correctly. With this end in view, tables for determining the adults are given, with brief descriptions of each species. The common gnat is so well known that no general description is necessary—all Diptera with a long proboscis and the same type of wing-venation as is found in *Culex pipiens* may be assumed to be "mosquitos." This term is rightly applicable to any member of the group, and should not be limited to a particular species or genus.

The following artificial key may serve as a rough guide in the identification of a specimen, but its proper generic position should, of course, be ascertained by the aid of the tables :—

- A. Tarsi ringed with white at the bases of the joints.
 - a. Metatarsi without a median pale ring
O. cantans, *O. annulipes*, *O. vexans*.
 - b. Metatarsi with a median pale ring.
Th. annulata, *Tæn. richiardi*.
- B. Tarsi pale-ringed, the rings embracing both ends of the joints.
 - a. Abdomen with a median longitudinal pale stripe, more or less interrupted.
O. dorsalis.
 - b. Abdomen without such stripe, but with whitish bands at the bases of the segments.
Th. morsitans, *Th. theobaldi*.
- C. Tarsi entirely dark.
 - a. Abdomen not scaly. *Anopheles*.
 - b. Abdomen scaly.
 - i. Segments of abdomen with complete basal pale bands.
O. diversus, *O. nemorosus*, *O. salinus*, *C. pipiens*.
 - ii. No complete pale bands on abdomen.
O. lateralis, *A. cinereus*.

TABLE OF GENERA.

Males (antennæ plumose):

- | | |
|---|----------------|
| 1. Scutellum rounded; legs very slender; abdomen without scales | 1. ANOPHELES. |
| Scutellum more or less trilobed; abdomen scaly (the scales are, of course, easily rubbed off, but will be quite evident except in very bad specimens) | 2. |
| 2. Palpi very short | 3. AÆDES. |
| Palpi long, rarely shorter than the proboscis | 3. |
| 3. Last two joints of palpi more or less swollen, and never curved upwards | 4. |
| Last two joints of palpi quite thin, curved upwards | 6. CULEX. |
| 4. Last joint of palpi distinctly thicker than the penultimate | 5. THEOBALDIA. |

Last joint of palpi never thicker than penultimate
usually distinctly thinner 5.

5. The smaller claw on the fore and mid feet simple
(metatarsi with pale rings in the middle) 4. *TÆNIORHYNCHUS*.
The smaller claw on the fore and mid feet toothed
(metatarsi not pale-ringed in the middle) 2. *OCHLEROTATUS*.

Females :

1. Palpi as long as proboscis 1. *ANOPHELES*.
Palpi much shorter than proboscis 2.
2. Claws toothed (rarely the hind pairs are simple);
abdomen pointed, ovipositor externally promi-
nent 3.
Claws all simple; abdomen usually blunt-ended;
ovipositor hardly visible externally 4.
3. Head almost covered with broad flat scales . . . 3. *ÆDES*.
Middle of head (above) with only quite narrow
scales 2. *OCHLEROTATUS*.
4. Hind metatarsus shorter than the tibia 5.
Hind metatarsus as long as the tibia 6. *CULEX*.
5. Cross-veins separated by less than the length of
the posterior, lateral vein-scales narrow . . . 5. *THEOBALDIA*.
Cross-veins separated by more than the length of
the posterior; lateral vein-scales mostly rather
broad 4. *TÆNIORHYNCHUS*.

Genus 1. *ANOPHELES*.

The species of this genus are readily recognized by the long female palpi, and by a number of minor characters, such as the absence of scales on the body.

We have only three species of *Anopheles* in Britain. Theobald, indeed, states that he has taken a fourth—the North American *A. barberi*—in England, but this requires confirmation. The larva of *A. barberi* is distinguished from those of other *Anopheles* by “the slight development of the head hairs, the presence of plumose hairs after the third abdominal segment, and the absence of short teeth on the comb of the eighth segment.”

1. *A. maculipennis*, Mg.; the Spotted Gnat.—Distinguished from the other two species by the presence of spots on the wings, formed by the accumulation of scales. Grey-brown to grey-ochreous in colour. Average length (without proboscis), 6 mm.

Widely distributed in the south and east of England, and common in marshy places; occurs also in North Wales.

2. *A. bifurcatus*, L.—Closely resembles *A. maculipennis* in size and colour, but differs most obviously in the entire absence of the dark spots on the wings. It seems to be less common than the preceding, but has a similar distribution.

3. *A. plumbeus*, Stephens.—Smaller and darker than the two preceding; the wings are somewhat narrower, the scales

being blacker and rather denser; the thorax (in good specimens) is ashy-grey in the middle, blackish at the sides, and bears anteriorly some white hair-like scales, the vestiture of the thorax in the other two species being yellowish; the abdomen is black, not brown or greyish-brown. Average length, 4·5 mm.

This species seems to have a wider distribution than the other two, as it has been recorded from Scotland and Ireland. As Theobald remarks: "There is little doubt that Haliday's [Stephens's] *A. plumbeus*, taken in the North of Ireland in July, is this species [*A. nigripes*, Staeger]." It is best known under this latter name.

Genus 2. OCHLEROTATUS.

This genus includes most of the European species till recently placed in *Culex*. It is, however, at least as distinct from *Culex* as *Aedes* is. The eggs are deposited singly (as in *Aedes*), not in masses (as in *Culex*).

The writer has been able to recognize eight species in Britain, which can be distinguished as follows:—

- | | |
|---|-----------------------|
| 1. Tarsi (especially those of the hind legs) pale-ringed | 2. |
| Tarsi entirely dark | 5. |
| 2. Pale rings of tarsi embracing both ends of the joints,
on hind legs the whole of the last joint is pale | 1. <i>dorsalis</i> . |
| Pale rings of tarsi at bases of joints only | 3. |
| 3. Pale rings of hind tarsi very narrow; wing-scales all
dark | 2. <i>vexans</i> . |
| Pale rings of hind tarsi broad, except on first and last
joints; wings with both dark and light scales | 4. |
| 4. Yellower species; a broad band of yellowish scales
on each side of the mesonotum | 3. <i>annulipes</i> . |
| Browner species; mesonotum mostly brown-scaled,
with lateral spots or lines of whitish scales | 4. <i>maculatus</i> . |
| 5. Segments of abdomen with basal pale bands; mar-
gins of thorax not whitish | 6. |
| Segments of abdomen with lateral basal white spots;
margins of mesonotum broadly white-scaled | 8. <i>lateralis</i> . |
| 6. Wings speckled with light and dark scales, on nearly
all the veins | 5. <i>salinus</i> . |
| Wings with few or no light scales | 7. |
| 7. Pale bands of abdomen yellow, tending to spread out
in the middle, and sometimes forming a median
yellow line on the last few segments | 6. <i>diversus</i> . |
| Pale bands of abdomen whitish, tending to spread
out laterally, and sometimes almost divided into
pairs of triangular spots | 7. <i>nemorosus</i> . |

1. *O. dorsalis*, Mg.—Scales of head bright reddish-brown at the sides, whitish in the middle. Thorax mainly clothed with bright reddish-brown scales, but with two rather broad whitish longitudinal stripes. Wings and legs speckled with dark and

light scales, as in *O. maculatus* and *O. nemorosus*. Abdomen with yellowish bands, each embracing two contiguous segments, and connected by a median dorsal yellowish line, so that in pale specimens each segment of the abdomen appears to have a pair of subquadrate dark brown patches. Average length, ♂ 6.5 mm., ♀ 5 mm.

This species occurs abundantly at Aldborough, Suffolk, and has been taken at various places in the London district (Charlton, Dartford, Albert Docks, Lewisham, Camberwell, Chiswick, Stamford Hill), and at Rochester and Wyre Forest.

I believe that Rondani's *Culex pulchripalpis* and *C. penicillaris* are both synonyms. Theobald introduced *C. pulchripalpis* as British on the strength of some specimens of this species taken at the Albert Docks.

2. *O. vexans*, Mg.—Thorax dark brown, uniformly clothed with dark golden-brown scales. Pale bands of abdomen (in female at least) narrowly interrupted at the sides and indented in the middle, so that they appear bilobed. Male genitalia very peculiar, the claspers being forked. Average length, ♂ 6 mm., ♀ 5 mm.

This species has at present but slender claims to a place in the British list. It has been confused with *Theobaldia morsitans*, and probably some of the old records of *O. vexans* really refer to that species. In the old Clifton collection in the British Museum were seven specimens of this species, all without locality label—three females unnamed, and two males, two females labelled “? *calopus*, Meig.” Apart from these the only British specimens I have seen or heard of are a male and female in the Cambridge Museum, taken at Mildenhall, Suffolk, July, 1894, by Mr. C. G. Lamb. Both these are very much rubbed, and the characteristic abdominal markings of the female removed.

O. vexans occurs, I believe, in North America under the name of *sylvestrus*, Theo.—variously placed in *Culex*, *Ecculex*, or *Aedes*. Theobald's type was said to have the hind claws of the female simple, but most American specimens have them toothed, like the European *O. vexans*.

(To be continued.)

DESCRIPTION OF A NEW SPECIES OF ANOMALON (ICHNEUMONIDÆ) FROM HONGKONG.

By P. CAMERON.

Anomalon pyretorum, sp. n.

Ferruginous, the abdomen brighter in tint; the front broadly, the vertex less broadly, occiput, the greater part of mesonotum, the lower part of the pro- and mesopleuræ, the metathorax, and more than

the basal three-fourths of the second abdominal segment above, black; the four front legs bright yellow, the coxæ broadly at the base below rufous, the hind legs rufous, the coxæ in the middle broadly above and entirely below, and the apical third of the hind tibiæ, black, the hind tarsi yellow, tinged with fulvous, the base rufous. The face, clypeus, mandibles, and palpi bright yellow, as are also the malar space and a line on the lower part of the outer orbits. Wings fulvous-hyaline, the apex broadly tinged with fuscous violaceous, the nervures black, the costa and stigma rufo-testaceous. Male. Length, 28 mm.

Bred from the larva of *Saturnia pyretorum*, West. Received by Mr. J. Henry Watson from Hongkong.

Head, thorax, and base of legs densely covered with pale, almost fulvous pubescence. The vertex between the ocelli is irregularly, stoutly striated, a stout stria runs down from outside the posterior ocelli, and two stout oblique ones from between the outer and lower. Parapsidal furrows with stout striae, which are more numerous on the base. Middle of propleuræ stoutly striated, the striae almost forming reticulations; there is a broad reticulated band on the mesopleuræ below the middle, the band widest at the base. Metathorax strongly reticulated. Mesosternal furrow curved, crenulated; it is on the basal two-thirds. The transverse median nervure is received shortly beyond the transverse; in the hind wings the transverse cubital is broken shortly below the middle. The basal joints of the flagellum are yellow below.

SOME NEW SPECIES OF *ZAMARADA* (FAM. GEOMETRIDÆ).

By LOUIS B. PROUT, F.E.S.

CHIEFLY through the kindness of Mr. F. W. Short, B.Sc., F.I.E., of Selukwe, S. Rhodesia, I have accumulated some very interesting material in the genus *Zamarada*, Moore, which seems to be remarkably prevalent in his district. As most of the forms are represented by more than one specimen, and entirely without intergrades, there can be no reasonable doubt as to their specific rank, although the structural uniformity throughout the genus robs one of the most decisive criteria. I subjoin descriptions of the new species.

Zamarada bathyscaphes, n. sp.

♂ ♀, 26-27 mm. Face and palpus mixed red and pale ochreous. Vertex and antenna pale ochreous; occiput red. Thorax and abdomen above red, beneath (with legs) pale.

Both wings very pale, iridescent yellow-green, with small basal patch, broad distal border, slight inner-marginal shading and very small discal spot red (a blend of bright rufous, yellowish and violet scales), the fore wing in addition with costal edge (to SC) ochreous

spotted with red; the distal border 4 mm. broad anteriorly on fore wing, slightly less posteriorly and on hind wing, margined by a fine darker red or blackish line proximally and traversed by a usually indistinct, interrupted, dentate, pale (in some lights silvery) sub-terminal line; between R^3 and M^2 the ground colour encroaches very deeply into the band, almost touching the termen at M^1 and M^2 , but leaving a small pyramidal red spot between these veins. Fringe yellowish, marked with red at the vein-ends. Under side similar, slightly paler, the red border without markings.

Selukwe, October, 1911; two females (type and co-type). Also three males: one taken early in 1911; one, December, 1911; one, March, 1912. In the females the discal spot of hind wing is almost obsolete, but it is distinct in all the three males. Otherwise there is no appreciable variation, except slightly in the strength of the markings on the border. May possibly prove a local race of *culpina*, Warr. (Novit. Zool. iv. 123), from West Africa.

Zamarada purimargo, n. sp.

♀, 29 mm. Face and palpus rufous mixed with pale ochreous. Vertex and antenna pale ochreous. Occiput with thorax and abdomen dorsally bright rufous with slight violet reflections.

Fore wing very pale, translucent yellow-green, with hyaline reflections, veins yellow; costa to SC pale ochreous, except at base, a small red basal patch, a distal border of about the same breadth as in the preceding species, of a delicate rufous with a slight admixture of shining violet scales, without traces of pale or dark markings, and with only a comparatively shallow, rounded sinus (narrowing the border by less than half its width) between R^3 and M^2 . Hind wing similar excepting costa, but the basal patch much smaller and the proximal edge of the red border running obliquely after the sinus, so as to reach inner margin at middle. Fringes pale yellowish, tinged with red proximally. Under side quite similar, somewhat more washed-out.

Selukwe, October 20th–27th, 1911; type in coll. L. B. Prout. A co-type, precisely similar, but with minute discal dots, which are virtually obsolete in the type, Lilongwe district, Central Angoniland, 4–5000 ft., June 2nd, 1910 (S. A. Neave) in coll. Brit. Mus.

Perhaps nearest to *pyrocincta* ab. 1 of Hampson (Proc. Zool. Soc. Lond., 1910, p. 470), but with larger basal patch, terminal bands broader, more devoid of markings, and at inner margin of hind wing quite differently shaped.

Zamarada nebulimargo, n. sp.

♂, 27–29 mm. Face and palpus ochreous, mixed with reddish fuscous. Vertex, antenna, and dorsal surface of body the same, body beneath and legs (excepting upper and inner side of fore leg) without fuscous admixture.

Fore wing pale brownish ochreous, very finely (along costa coarsely and more densely) speckled with fuscous, the costal region to SC somewhat deeper and brighter ochreous, inner-marginal area also somewhat clouded: a large, somewhat diamond-shaped purple-fuscous discal spot, blacker at edges, and a moderately broad distal border of a somewhat darker, more reddish tone, irregularly dusted with purple-fuscous, this dusting sparse in distal half, but concentrated in proximal into a somewhat interrupted purplish band from SC to inner margin (weakest between radials), followed by some tooth-shaped dark markings between the veins; the sinus between R^1 and M^2 , common to most of the genus, is present though not very deep; a very fine sinuous ferruginous-fuscous line precedes the border; terminal dark line slightly interrupted; fringe pale brownish ochreous. Hind wing similar, the purplish half-band in distal area somewhat weaker. Under side similar, more thinly scaled, almost unmarked excepting the cell-spots and submarginal band, which are rather deeper purple; costa nearly as above; marginal band ochreous, not reddish-tinted.

Selukwe, October, 1911; type in coll. L. B. Prout. Three other males, worn, but recognizable (by their colour, large discal spots, &c.), October, 1911, and March, 1912; also in coll. L. B. Prout. Victoria Falls, February 20th, 1911 (L. A. Sabine), male in coll. L. B. Prout. Salisbury, Mashonaland, March, 1899, February, 1900, and March, 1905 (G. A. K. Marshall); Fort Jameson to Lundazi, N.E. Rhodesia, 4000 ft., June 14th, 1910 (S. A. Neave); all in coll. Brit. Mus. Female still unknown.

Perhaps rather near *ochrata*, Warr. (Novit. Zool. ix. 518), from British East Africa, but larger, without basal patch and median shade, and with other differences.

Zamarada ignicosta, n. sp.

♂, 27 mm. Face, crown, and proximal half of antennal shaft pale ochreous, almost entirely covered with bright rufous speckling. Palpus, antenna distally, and collar pale ochreous. Thorax and abdomen above mostly covered with bright rufous and violet, the former with a narrow anterior band concolorous with costa of fore wing, the latter with paler mediodorsal spots.

Wings hyaline, very pale greenish, with iridescent reflections; a rather faint but coarse speckling or short strigulation of reddish brown, denser at inner margin. Fore wing with costal margin reddish ochreous much mixed with bright red and sprinkled with minute lustrous bluish-silvery scales. Both wings with indistinct dark discal dot and rather narrow distal border, formed and coloured about as in the Indian *translucida*, Moore, bounded proximally by a deeper red line and traversed by an interrupted, dentate silvery line, which encloses proximally within some of its teeth subtriangular red spots of a deeper red colour than the ground of the border; traces of other silvery lines proximally and distally to the dentate line. Fringe reddish, darkest opposite the veins; a sprinkling of minute silvery scales. Under side with the border present, but duller; no lustrous scales.

Victoria Falls, Rhodesia, May 26th, 1911 (L. A. Sabine); type in coll. L. B. Prout. A second male from Upper Luangwa, Luwumba Valley, N.E. Rhodesia, 2500-3500 ft., July 21st, 1910 (S. A. Neave), in coll. Brit. Mus., may belong to the same species, but the vertex and antennal shaft are pale (the specimen possibly a little faded), and the under side has, at the two broad parts of the fore wing border and the anterior one of the hind wing, blackish proximal markings of which the type shows no indication.

Although the ground colour of this species, when viewed from above, is nearly as green as that of *bathyscaphes*, *purimargo*, &c., the iridescent reflections are mainly pink and purple, giving it an entirely different aspect on a change in the incidence of the light.

Zamarada fessa, n. sp.

♂ ♀, 24-30 mm. Head, body and wings pale grey with a slight lilacine tinge, more or less speckled with fuscous; the under side of body, with legs, paler and more ochreous, scarcely speckled.

Fore wing with costal margin ochreous, densely dark-speckled, as far as outer line otherwise hyaline, almost colourless, somewhat less iridescent than in most of the allies; a distinct black discal dot; a moderately broad distal border formed of a blend of violet-grey and reddish scales and containing some very slightly darker, redder dentate spots suggesting a very vague and interrupted band before the subterminal, the subterminal itself almost entirely obsolete; a weakly lunulate-dentate dark line (proximally ochreous-edged) bounds the distal area, into which the ground colour projects moderately between R^s and M^2 ; terminal line more ochreous; fringe grey. Hind wing similar, excepting the costa. Under surface with the distal border more sombre, more uniform, not bounded by a dark line.

Selukwe, four males, four females, October, 1911, to January, 1912; the type (a female) taken October 20th-27th, 1911; all in coll. L. B. Prout.

Zamarada metrioscaphes, n. sp.

♂, 26 mm. Face, vertex, and antenna ochreous, spotted with blackish fuscous. Palpus ochreous. Abdomen dorsally purple-fuscous, with some ochreous spots.

Fore wing pale, translucent yellow-green irrorated with scattered fuscous strigulae, more copious at inner margin; costa to SC ochreous coarsely marked with blackish, especially in proximal half; discal spot moderately large, purple-blackish; distal border purple, somewhat mixed with reddish ochreous, preceded by a fine, weakly lunulate-dentate black line, the encroachment of the ground colour between R^s and M^2 deeper than in *transvisaria*, Guen., but not so deep as in *bathyscaphes*, narrowing the border by slightly more than one-half; in the middle of the border, interrupted from R^s to M^2 , runs an acutely dentate pale ochreous subterminal line enclosing proximally some sharply-marked dark pyramids between the veins,

their bases redder, their apices blacker; terminal line reddish ochreous; fringe olivaceous, at base pale ochreous, dark-spotted opposite veins. Hind wing similar, discal spot small. Under side similar, but with distal border mostly pale, only purplish in anterior half of fore wing and proximal part of anterior half of hind wing, the sub-terminal line and pyramids wanting.

Selukwe, November, 1911; type in coll. L. B. Prout. A worn female with the border more reddish (same time and place) is probably also referable here. Near Chikawa, Lower Shire Valley, Nyassaland, 600 ft., April 12th, 1910 (S. A. Neave), co-type (male) in coll. Brit. Mus.; also a female, slightly larger and duller, from Blantyre, Nyassaland (J. E. S. Old), in coll. Brit. Mus.

In coloration, &c., this species suggests a small edition of *transrisaria*, Guen., except for the dark irroration and the shape of the distal borders.

Zamarada aclea, n. sp.

♀, 26–27 mm. Very like the forms of *translucida*, Moore, with the narrowest border and the purple-brown parts lightest and most reddish, but differing as follows: Body and border of wings slightly more reddish still, the latter perhaps slightly narrower; the green ground colour lighter, a small red basal patch present on fore wing; the minute dark discal dots obsolete, the entire green area, on the other hand, faintly dotted and strigulated with grey; under side with the border bicoloured, its proximal part in apical half of both wings and towards tornus of fore wing being dark (nearly as in *translucida*), the rest much lighter and redder, fading off still further towards tornus of hind wing.

Selukwe, November, 1911 (type), and December, 1911 (co-type); both in coll. L. B. Prout.

DESCRIPTION OF A NEW ETHIOPIAN CICADA.

By W. L. DISTANT.

Platyleura liberiana, sp. n.

Body and legs pale ochraceous; vertex of head with a spot at each anterior angle, a waved transverse fascia widened at area of ocelli, and three small irregular spots at base near each eye, fuscous or black; pronotum with the subanterior margin (medially broken), two small central spots near base, and the outermost fissures, black; mesonotum with four obconical spots—the two central spots smallest—and a spot at each anterior angle of the basal cruciform elevation, black; abdomen above, with the exception of central longitudinal disk, pale castaneous; tegmina opaque, dull greyish with darker shadings, the venation, costal membrane, and basal area pale ochraceous; wings dark ochraceous, opaque, shadings at the bases and apices of the apical areas, along the inner longitudinal veins, and

most of the posterior margin dark castaneous, the inner half of the posterior margin greyish brown; head, including eyes, about as wide as base of mesonotum, not frontally produced, anteriorly subtruncate, ocelli large, the frontal ocellus almost visible beneath above face; face longer than broad, strongly, centrally, longitudinally sulcate, finely, transversely striate, cheeks globosely prominent; antennæ black; pronotum with the lateral margins amplified, and broadly, centrally angulated, about as long as mesonotum in front of the cruciform elevation, abdomen moderately elongate, but not longer than space between apex of head and base of cruciform elevation; opercula in male short, obliquely rounded, not extending beyond basal segment of abdomen, and almost meeting internally; rostrum reaching the posterior coxæ, its apex black; abdomen beneath with the stigmatal spots ivory white. Long. excl. tegm. ♂ 27 millim.; exp. tegm. 75 millim.

Hab. West Africa; Liberia (W. P. Lowe—Brit. Mus.).

A very distinct species, belonging to the section of the genus characterized by having opaquely coloured tegmina and wings, and may be placed near *P. makaga*, Dist.

DORSET ODONATA IN 1911.

By F. H. HAINES, D.P.H. (Lond.), &c.

A FEW observations made by me round Winfrith last summer may be of interest in connection with Mr. Lucas's notes on British Odonata in 1911.

Sympetrum striolatum and *S. scoticum* were abundant as usual. The latter is generally confined to fenny places, near the heathlands. *Libellula depressa* is always widely distributed and common. I first noticed *L. quadrimaculata*, in great abundance, round a large pond on Morden Heath, on May 27th. On June 20th, it was common at Trigon near Wareham, and was far more widespread than usual in all suitable spots, such as open fir-woods and wet moors, from Holme to Moreton throughout June. *L. fulva* occurs every year, in some plenty, over a few square yards of ground near a boggy area at Holme. Here it settles very warily on small fir-trees and furze bushes. Once known, flying or settled, it could not be easily confused with any other species. It is to be found at the end of May, and blue males are seen quite at the beginning of June. Last year it was in remarkable profusion here and there over the same stretch of wild country as *L. quadrimaculata*, and continued well into July. *Orthetrum cærulescens* abounds over the heathy swamps every year, and I noticed, as I had not done previously, *O. cancellatum* at East Lulworth and Moreton in sandy hollows and on the road. *Cordulia aenea* swarmed at Morden on May 27th on a very large extent of morass and wet fir plantations, and over the

very large pond in the woods there. A few specimens were still about on June 28th. *Cordulegaster annulatus* is frequent every year. I saw *Anax imperator* first at Trigon on June 20th. Later I noted two specimens at Moreton. *Brachytron pratense* was in evidence at Holme about the end of May. In June I took it on damp ground covered with rank growth by the Frome at Iford. Feeling certain that I can distinguish *Aeschna mixta* from *Æ. juncea* on the wing, partly by its smaller size, but more especially by its very different habit of flight, I can all but positively record three specimens—one at Bindon Abbey, one at East Stoke, and one at East Lulworth. *Æ. juncea* is fairly distributed year by year from Galton to Parley and Arne. *Æ. grandis* occurred at Holme near East Burton, and at Bindon Abbey. *Calopteryx splendens* is ever in profusion in open flowery tracts by the Frome and its branches. *Lestes sponsa* is common here, as is also *Pyrrosoma nymphula*. *P. tenellum* was met with, as is the rule, at Tadnoll marsh. It was frequent, too, on Studland Heath. *Ischnura elegans*, *Agrion puella*, and *Enallagma cyathigerum* were once more in force in their haunts.

I may add that I took eight specimens of *A. mercuriale* in this immediate neighbourhood, doubtless near the Frome, a few seasons ago. Not distinguishing the species at once, the precise place of capture is unknown to me and I have never met with it again.

I do not work the Odonata in my leisure more than other orders, and the species named above, with *Æ. cyanea*, are all I identified here last season.

Brookside, Winfrith, Dorset : May 4th, 1912.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S., &c.

(Continued from p. 180.)

JULY 8th was a very hot day—eighty-one degrees in the shade at noon. Three *T. apiformis* were taken on poplars. I have lately been breeding a number of *Pieris napi* from South of Ireland ova—no particular varieties, but some very bright and clearly marked specimens.

The 11th was fine, bright and hot, with a fresh north-easterly breeze. I went to the distant woods, as I wanted some fresh *Argynnis adippe*, but I only saw one specimen of that species, seven or eight *Limenitis sibylla*, and about a couple of dozen *A. paphia*; these three species used to swarm in these

woods some years ago, but they now seem to be nearly extinct. *Adopæa thaumas* (linea) was plentiful and fresh, and I took one *Herminia derivalis*, but saw nothing else worth noting.

The 12th was another very hot day. The second brood of *Cyaniris argiolus* was now rather numerous, and *Arctia caja*, *Noctua baja*, &c., were appearing in my breeding-cages. The larvæ of *Saturnia carpini*, from the ova laid on May 13th, were now full grown. I sleeved them on a willow-bush in my garden.

The 14th was very hot. I had a beautiful variety of *A. caja* brought me, with hind wings bright yellow. I went to the lanes and marshes in the evening and I noticed quantities of beautifully fresh *Adopæa lineola*, sitting on grass-stems after sunset, and boxed a couple of dozen, nearly all males. I also took five *Leucania faveicolar* on flowering grasses, two of which were the red var. *rufa*, and two the yellow var. *lutea*. *L. impura* was abundant, also *Miana colorata*, but not much else except a few *Anerastia lotella* and one *Spilodes (cinctalis) verticalis*. *C. dotata* was flying commonly in the lanes.

The 17th was fine, overcast, very warm, and nearly calm. At night I went to the marshes and sandhills and found moths swarming on the marram grass. I took several *L. faveicolar*, but they were so worn I had to release them the next morning. *M. abjecta* was in fair numbers; *L. pallens*, *L. impura*, *Apamea oculea*, *Miana bicolorata*, and *Xylophasia polyodon*, in profusion; and among the others were *Agrotis nigricans*, *Leucania conigera*, and *Hydrilla paludis* (one); *A. lineola* was also plentiful on the grass-stems.

21st. The hot weather still continued, and in the evening, as it was almost calm, with no dew or moon, I went to the reedy dykes, but did not see much flying at first, except a few *Chilo phragmitellus*. Upon reaching a favourable-looking place, I stood still and threw the light of the lantern on to the reeds, and presently a moth fluttered out towards me and was netted, and proved to be *Senta ulcæ maritima*. This was a good beginning, so I remained where I was for nearly two hours, just moving a pace or two to the right or left, and every minute or so a moth came out (sometimes two or three together), and I eventually found that I had secured thirteen *S. maritima*, seven *Nonagria arundineta*, two *Leucania straminea*, one *Hydræcia paludis*, and several *Chilo phragmitellus*, *Timandra amatoria*, *Coremia undentata*, and *Agrotis tritici*. On my way home I passed a large clump of flowering rushes, and upon every flower there were two or three moths, chiefly *L. conigera*, *L. lithargyria*, *L. impura*, *T. amatoria*, *E. pumilata*, &c.

On the 22nd I bred eight *Drepana hamula*, from ova laid by the female captured on May 29th. The larvæ were sleeved upon an oak in my garden. (I subsequently bred about thirty more, and obtained a batch of ova.)

The 23rd was bright and very warm—ninety-six degrees in the shade. *Pelurga comitata* and *Tortrix viburniana* were now appearing in breeding-cages. The evening of the 25th was fine, calm, close, and very warm, with lightning and distant thunder. I visited the reed-dyke again, and netted thirty *N. arundineta*, six *S. maritima*, three *H. paludis*, one *M. maura*, &c. About half the *arundineta* I have taken are the black form *dissoluta*. This moth flies low down among the reeds, and I seldom saw any flying high above them, so it requires a quick eye to see them.

26th. Similar weather to yesterday, only there was a sharp thunder-shower about 7 p.m. Visited the reeds again and got more *arundineta*, *maritima*, *straminea*, *paludis*, &c.; among the former there were two very interesting red varieties, and among the *maritima* there were several var. *bipunctata*. On my way home I found *T. amataria* and *A. emarginata* swarming, but they were mostly worn, and among others I netted *Lithosia griseola*, *L. complanula*, *Culamia phragmitidis*, *Boarmia rhomboidaria*, &c.

The 28th was a fine and very hot day. In the evening I went to the salterns and sea-banks. I found moths swarming on marram grass, but there was nothing fresh—chiefly *L. impura*, *M. abjecta*, *H. paludis* (already worn), &c. It began to rain at about ten o'clock, with thunder and lightning, and I was afraid a big storm was coming on, so I hurried home.

(To be continued.)

NOTES AND OBSERVATIONS.

NATURAL History Books from the library of the late Mr. A. Harrison will be sold by Mr. J. C. Stevens at his Auction Rooms, King Street, Covent Garden, on July 9th.

CAPTURE OF MOTHS AT SEA.—Some months ago my friend Dr. Charles Chilton kindly forwarded to me, in case they should be of interest, some moths taken at sea during his voyage from New Zealand to this country. He wrote as follows:—"During the morning of November 26th, a moist, hot day, while the 'Ionic' was a considerable distance off the coast of America, many small moths were blown on to the steamer, and many more were seen on the surface of the sea. This continued all the morning, and, though in less numbers, some were blown on during the afternoon, and a few were seen the next morning; our position at noon that day was 28° 24' S., 46° 30' W. One, or perhaps two, small land birds were seen on the ship at the same time." The position indicated is about one hundred miles off the coast of Montevideo. The insects proved to be almost all Geometrids, and I therefore passed them on to my friend Mr. L. B. Prout, who has been good enough to identify them as follows, viz.:—*Pleuroprucha insularia*, Guen. (1 male); *Amaurinina carnana*, Druce (8 males, 9 females); *Eupithecia*, sp. (worn) (1 female); *Doche-*

phora pilosa, Warren (2 females); *Eudule hesperina*, Burm. (1 female); *Macaria regulata*, Fab. (1 female); *Pantherodes pardalaria*, Guen. (1 female); *Bronchelia pulicaria*, Guen. (1 female). There was also a Tortricid altogether denuded and unrecognisable, and I think it very likely that there were other Micro-lepidoptera unnoticed; on these occasions the larger specimens are naturally selected. It will be seen that all are insects of weak flight, whilst the more robust and powerful insects are absent. I imagine the effect was due to a small whirlwind (which might naturally arise in such weather) carrying the insects up to some height and then drifting out to sea with them; it could not have been a strong one, as all active fliers were able to escape.—EDWARD MEYRICK; Thornhanger, Marlborough, June 17th.

ABUNDANCE OF THE LARVÆ OF ABRAXAS GROSSULARIATA AT HUDDERSFIELD.—I note from the current number of the 'Entomologist' (pp. 184 and 187) that Messrs. T. A. Blenkarn and L. W. Newman record the larvæ of *Abraxas grossulariata* as having been excessively scarce in the South of England this spring. Here there has been no lack of them. From one market-garden close to the town I have had six thousand larvæ and pupæ, and could probably have had twenty thousand from the same garden had there been time to pick them off, or to manage them when collected! They were full-fed unusually early this year, and at the beginning of May a schoolboy collected them for me in the evenings, &c., after school hours. On his earlier visits he said he could collect them faster than he could count them, then suddenly two pairs of cuckoos took up their quarters in the garden, when at once it became a race as to whether he or the cuckoos should get most! The cuckoos beat him by a long way, for in a few days they had practically cleared off the lot. The owner of the garden told me the cuckoos never left it, and seemed to be almost always feeding on the caterpillars, except when the two pairs were quarrelling over them, which, when they came near each other, they often did, and made plenty of noise over it! Probably they never before had such a time in their lives. Large numbers of the gooseberry-bushes were absolutely stripped of every vestige of leaf, and many of the currant-bushes also suffered terribly. I never before saw anything like it with this species.—GEO. T. PORRITT; Dalton, Huddersfield, June 6th, 1912.

MONOCHAMUS GALLOPROVINCIALIS, Oliv., IN HACKNEY.—On May 30th a living specimen of this longicorn was found in the analytical laboratory at Messrs. W. S. Bush & Co.'s works, Ash Grove, Hackney. In the morning, a boy picked up a duster off a bench, when the beetle nipped him. Mr. L. Slarn, one of the analysts, secured the insect, which was then forwarded to Mr. C. J. Gahan, who has kindly identified it as above. He also adds that he does not remember any previous record of the beetle having been captured in this country.—J. O. BRAITHWAITE; 18, Warren Road, Chingford.

[*M. galloprovincialis*, Oliv., is very like *M. sutor*, L., and it is quite possible that some of the records of the latter species really apply to the former. It is distinguished from *sutor* by having a naked triangular spot at the base of the scutellum, instead of a line extending right up to the apex, and by having the acetabula of the

front coxæ closed, or very nearly closed behind. In *sartor* and *sutor* there is a distinct and rather wide gap between the epimeron and the hind end of the prosternum, so that the acetabula are always open behind.—C. J. G.]

OVIPOSITION OF *PLUSIA MONETA*.—In reply to the Rev. W. Claxton's query on p. 181, I may say that the moths of the first brood (emerging about the end of June) deposit their ova on the flowers and flower-stems, and amongst the buds and capsules, of monkshood and *Delphinium*; those of the second brood (emerging in late August and September) probably oviposit on the seed-capsules or on late flowers, if any. I cannot say from experience whether this is so, but I have found very small larvæ feeding on the seeds of monkshood in late September in my garden here, in which the moth occurs commonly after Midsummer-day at the *Delphinium* flowers. The larvæ hibernate in the hollow stems of the plants near the surface of the ground, and if these be removed in winter I presume no larvæ would appear in spring. To this I attribute the fact that in some years my monkshood does not seem to be attacked, because I have removed the old stems, whilst the *Delphiniums*, whose stems were only cut down to within six inches of the ground, have been badly attacked. I should think it highly probable that the young larvæ would sometimes hibernate in the dead capsules, or even inside some of the seeds, and that Mr. Claxton's larva was curled up inside a seed, or at any rate was amongst the seeds when he got them, and so was on the spot when the seeds germinated. It seems to me extremely unlikely that the species would over hibernate as an egg. I should like to take this opportunity of thanking the few correspondents who were good enough to respond to my request for records of this species in May, 1911.—C. NICHOLSON; Hale End, Chingford.

In your last issue (*antea*, p. 181) the Rev. W. Claxton suggests that the ova of *Plusia moneta* are laid "on the seed of the plant while in the pod." Last night I watched a female ovipositing; she laid her egg on the unexpanded bud of a *Delphinium* flower. I have no doubt that, like most *Plusias*, *P. moneta* passes the winter in the larval stage, but I will try to watch this particular egg to note when it hatches.—PERCY C. REID; Feering Bury, Kelvodon, June 19th.

MR. CLAXTON'S theory (*antea*, p. 181) that *P. moneta* lays its eggs on the seeds of *Delphinium* while yet in the pod is extremely interesting, but all the evidence at my disposal, though not conclusive, is against it. In my garden there is a single clump of monkshood (*Aconitum*), which comes up regularly year after year, and in due course flowers, but to the best of my belief in the last twenty years, and certainly in the last ten, it has never succeeded in setting any seed, even in spite of attempts at artificial self-pollination. Nevertheless, from 1904 to 1907 the young larvæ of *P. moneta* appeared in the tips as soon as the shoots were an inch or two above ground. The eggs that produced these could not have been laid on the seeds of the plant, for there were no seeds, and no other plants of either *Aconitum* or *Delphinium* in any of the neighbouring gardens. The old stems were cut off and the ground dug over, even the tubers removed in the autumn of the previous year; consequently, if the eggs are

laid in the autumn, they must have been deposited in the ground about the roots of the plant, so that in the spring the newly hatched larvæ could find the springing shoots of the monkshood; or else, being laid on the plants, the eggs hatch in the autumn, and the young larvæ crawl down and hibernate in the crevices of the tubers. This, I admit, was my own theory, but it seems to be ruled out of court by Mr. Claxton's experiments. There yet remains the possibility that the moth itself hibernates, and deposits its eggs on the young shoots as soon as they appear. This theory seems perhaps the least incompatible with both Mr. Claxton's experience and my own, though I have no positive evidence that the moth does hibernate.—K. G. BLAIR; 23, West Hill, Highgate.

PLUSIA MONETA.—I am pleased to be able to record *P. moneta* for this district. I found one larva and six pupæ the first week in June, three of which have already emerged. Five were on *Delphinium* and two on monkshood.—ROBT. S. SMITH, Jun.; The Laurels, Downham Market, Norfolk.

COLIAS EDUSA IN BUCKS, AND SOME EARLY EMERGENCES.—On May 30th I was cycling from Great Missenden in the Wendover direction, when I saw a fine female *Colias edusa* by the roadside, evidently prospecting for a lucerne field, of which there are usually plenty in this neighbourhood. My last record for the country hereabouts is August 13th, 1901, north-west of Wendover. With the exception of the "whites," most of the common spring butterflies have put in a very early appearance this year. On April 20th *Euchloë cardamines* (males) were flying on the Chilterns near Kimble, and on the 21st at Pinner. *Pararge egeria* var. *egerides* was going over in the Bucks beech-woods on May 11th. On May 2nd *Canonympha pamphilus* was out here; *Chrysophanus phleas* on the 9th. *Callophrys rubi* swarmed on the Chilterns on April 20th—both sexes, and in the same locality *Celastrina argiolus*. The latter butterfly has been commoner than I ever remember it in our garden, the flight lasting from April 19th to June 1st, when one or two worn females still haunted the hollies. On May 30th *Aricia medon* (*astrarche*) was well out on the Chilterns, with occasional *Pararge megera* and *Angaules sylvanus*. *Thanaos tages* also was very common from May 11th onwards, *Hesperia malva* less so. The first *Polyommatus icarus* was out here on May 23rd (female, 25th), and individual males of *Cupido minimus* in Bucks on May 27th.—H. ROWLAND-BROWN; Harrow Weald, June 8th, 1912.

METRIOPTERA (PLATYCLEIS) ROESELII IN ESSEX.—On reading Mr. Campion's article in the 'Entomologist' for April (*antea*, pp. 117–18) it at once struck me that the description of this insect agreed very well with some examples I have taken on the North Essex coast during the past few years, and had labelled *P. brachyptera*. On comparing the specimens with the description in Mr. Burr's 'British Orthoptera,' the entirely pale margins of the pronotum seemed conclusive that it was really *P. roeselii*, and on my sending a specimen to Mr. W. J. Lucas, he confirmed the identification. The species seems to have been first met with in 1903, when a single male was taken, and one or more examples have occurred in most years since,

the largest number being in 1909, when four were taken. The nymphs seem more in evidence than the adult insects, over a dozen being seen in 1909, when they were observed towards the end of June and in July—the dates for imagoes being August 8th, 1904, August 30th, 1909, and most recently a single male on September 6th, 1911. It would therefore seem that the insect, though rare, is firmly established on the Essex coast, where it has probably occurred for many years, since the absence of wings would, as pointed out by Mr. Campion, render its dispersal by migration very difficult.—BERNARD SMITH HARWOOD; 62, Station Road, Colchester.

EARLY APPEARANCE OF BUTTERFLIES IN 1912.—Four specimens of *Callophrys rubi* were taken on April 23rd; a female specimen of *Chrysophanus phleas* on May 13th, and a male *Ctenonympha pamphilus* on May 14th.—G. B. OLIVER; Tettenhall, Wolverhampton.

AGROTIS PUTA IN MAY.—While working lamps in Cambridge on May 11th I was surprised to observe a fair number of *Agrotis puta*. I took two males in excellent condition, and saw about half a dozen more. The only other Noctua taken was a venerable *Gonoptera libatrix*, though it was barely a fortnight since the disappearance of the Tæniocampids. I took *A. puta* here in June, July, and August last year, but have never before taken it in May. Presumably it is occasionally double-brooded, and in hot seasons, when the moths emerge early, the larvæ pupate in the autumn instead of in the spring, and so are ready to emerge some months before their normal date.—(Rev.) C. E. RAVEN; 4, Park Terrace, Cambridge.

SPRING LEPIDOPTERA, &c., IN ESSEX, 1912.—A few dates of first appearances noted here may be useful for comparison:—February 12th, *Hybernia progemmaria*; March 11th, *Anticlea badiata*, *Amphidasys prodromaria*; 21st, *Diurnea fayella*; 27th, *Brephos parthenius*; April 17th, *Lycæna argiolus*; 21st, *Euchlor cardamines*, *Anticlea derivata*; May 7th, *Platypteryx hamula*; 8th, *Heimerophila abruptaria*, *Rumia cratægata*, *Cilix spinula*; 9th, *Lydia adustata*, *Pyrausta purpuralis*; 12th, *Stenopteryx hybridalis*; 13th, *Heliodes arbuti*, *Conchylis straminea*; 17th, *Chrysophanus phleas*; 18th, *Euchelia jacobææ*, *Penthina pruniana*. Finally, the cuckoo was heard on April 19th, and the nightingale on April 20th.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford.

GYNANDROUS CYANIRIS ARGIOLUS.—I took a gynandrous specimen of *C. argiolus* on April 26th in Sutton Park, the right side being the male. This species was plentiful on April 22nd, and even at that date some of both sexes were badly worn.—G. B. OLIVER; Tettenhall, Wolverhampton, May 24th, 1912.

SPRING BROOD OF CYANIRIS ARGIOLUS.—This pretty little "blue" was quite common in our garden this spring, flying over holly-trees on sunny days in April and May. The first appearance noticed was on April 21st, when half-a-dozen were seen at one time.—JOSEPH ANDERSON; Chichester.

PYRAMEIS ATALANTA AND P. CARDUI AT CHICHESTER.—Notes on the occurrence of these butterflies in May appeared in last month's 'Entomologist' (p. 182). A worn specimen of *P. atalanta* was taken

on an elm in front of the house; also in the same place and on the same date, May 13th, two *P. cardui*.—JOSEPH ANDERSON.

VANESSA ANTIOPA IN KENT, 1911.—It may be of interest to record the capture of *V. antiopa* last August at Chelsfield, Kent. The insect was taken by Master Arthur Rolls, and is unfortunately much damaged. I have to-day seen it among some insects he has.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey.

ACHERONTIA ATROPOS AT BRADFORD.—On May 23rd a very fine specimen of *Acherontia atropos* was picked up in the roadway at Low Moor, Bradford. The moth was in excellent condition when taken, although the weather was rough and wet at the time.—WM. BARREACLOUGH, Holly Hall, Low Moor, Bradford, June 15th, 1912.

DAPHNIS (CHEROCAMPA) NERII IN KENT, 1911. — I was lately shown what would have been, had it fallen into "good entomological hands," a fine specimen of that rare visitor to Britain, *Cherocampa neri*. It was taken by Mr. J. Diamond, of Chilmington, Great Chart, near Ashford, in his dairy late last autumn. The wings are still in fair condition, but the abdomen and thorax are almost denuded of scales, the antennæ and legs are gone. I have set the insect, and it is now in the possession of Mr. Gandy, of 63, Beaver Road, Ashford, to whom it was given by the captor.—CHARLES VIGGERS; 49, Sussex Avenue, Ashford, Kent, June 7th, 1912.

PHRYXUS (DEILEPHILA) LIVORNICA IN CORNWALL.—I have to record the capture of twenty more *P. livornica* between May 18th and 23rd also in South Cornwall. Several were females with fully developed ova.—B. HAROLD SMITH; Edgehill, Warlingham, Surrey, June 6th, 1912.

PHRYXUS (DEILEPHILA) LIVORNICA IN NORTH WALES.—I have to report the capture by me of *D. livornica* (the striped hawk) at *Silene maritima* flower on May 25th, 1912. Is this a new record for North Wales?—F. SEYMOUR JACKSON; Hafod, Aberdovey, Merionethshire, June 2nd, 1912.

PHRYXUS (DEILEPHILA) LIVORNICA IN NORFOLK.—On May 22nd a nice specimen of *Deilephila livornica* was taken at rest on a shop window in this town. It is the first I have heard of from this locality, and is now in my possession. I see in 'The Field' that another specimen has lately been taken near Flax Bourton. I have seen several specimens of *Vanessa cardui* about lately in this district.—F. H. BARCLAY; The Warren, Cromer.

SPILOSOMA URTICÆ IN ISLE OF WIGHT.—I am glad to be able to record the capture of a female specimen of *S. urticæ* (water ermine) in Sandown Marshes, May 28th. Only one specimen has been taken in the Isle of Wight before, and this is now in the collection of Mr. J. Taylor, of Sandown. Another capture of interest was a very fine specimen of *Zygana trifolii* var. *confluens* in Brading Marshes, taken on May 29th.—STANLEY A. BLENKARN; "Norham," Cromwell Road, Beckenham, May 29th, 1912.

DIAPHORA MENDICA IN IRELAND.—I obtained here yesterday a typical female specimen of *Diaphora mendica* (pure silky white), with

five spots on each fore wing, and apparently newly emerged. She deposited a few ova, but I fear that those are infertile.—HUGH F. STONEHAM; Kinsale, co. Cork, May 24th, 1912.

COLLECTING IN WESTMORLAND, 1911.—June 12th was a fine, bright day, and *Lycana icarus* (male) was out in swarms. The disparity in size between examples of the same brood from the same locality is astonishing. Our largest males, when set, measure exactly $1\frac{3}{4}$ in. from tip to tip—the smallest (both sexes) exactly 1 in. Some females are almost as “blue” as the males (except of course the extreme margins of the wings), but in their case the blue has very often a pronounced lilac tinge. Occasional specimens (female) have a distinct bluish-white wedge-shaped mark on the upper side of the disc of the hind wing, and examples with whitish patches near the apex of the fore wing are somewhat commoner. The same day I found males of *Augiades sylvanus* plentiful and in beautiful order. Several males and one female of *Diacrisia sanio* were netted. A dozen ova from the latter hatched very quickly, and the young larvæ fed so vigorously that I had hopes of rearing the second brood, but in this I was disappointed. After reaching a certain stage their appetite failed, and they are now, after trying unsuccessfully to hibernate, all dead. Mr. Holmes from a similar number of ova obtained from a female taken a month later had one larva go through, and that produced a fine male on August 29th. One wonders as to the cause of such erratic behaviour, for it would be hard to imagine a season theoretically more suited to the production of a second brood of this species. June 13th saw a new batch of *C. typhon* emerging, and I was fortunate in netting a fair series. The day was windy, and every individual had to be “kicked up.” After battling with the breeze for a moment or two, they would be swept away for fifty yards before they could alight, and then could be marked down and generally captured. A number of perfect female *A. sylvanus* and one fresh *Hyria muricata* were taken on the following day. I noticed some *L. icarus* resting on grass-heads at 6 p.m., and as they were still in the same position at 9.30 p.m., assumed that they had at that hour begun to take up their positions for the night. Quite a number of *C. pamphulus* were observed at the same time, resting upon the yellow centre of the ox-eye daisies.

June 16th, a dull day with a strong wind, found me again on the “moss.” *C. typhon* would not rise at all. A storm was threatening, and they seemed to know it. I have noticed that in bad weather they creep low down amongst the grasses, after the manner of *Erebia cassiope*. On some high-lying marshy ground (1000 ft.) freshly emerged males of *A. selene* were found fully three weeks later than on the lowland limestone, although here we noticed projecting from a willow trunk two freshly vacated pupal cases of *T. crabroniformis*, a species we are accustomed to take in early July! The vagaries of the season have been bewildering. About this date I had the mortification of losing a fine brood of *Lithomia solidaginis* through diarrhoea, caused, I believe, by the birch carelessly supplied them being saturated with honeydew. Honeydew was greatly in evidence during the summer months, and consequently “sugar,” so

productive last year, was a complete failure. Mr. Mallinson reported numerous captures at dusk on *Silene* flowers—*C. porcellus*, *C. umbratica*, *D. cucubali*, *P. iota*, *P. pulchra*, and *P. interrogationis*. Three *Phaosia dictaeoides* appeared in the pupa-cage on June 20th. There is something peculiar about this insect. Mr. Mallinson took it freely at light in early May, and again in August. Yet, out of the seventy odd pupæ carried over winter by the Kendal collectors, the above three were the first to emerge. More dribbled out during July, but fully half the total number are lying over. I cannot recall ever breeding or catching a May specimen here, although Kendal is only nine miles distant from Windermere. *E. caesiata* was out and in good condition on June 23rd, and on the 27th I found, by searching poplar, nine newly hatched *S. populi*, three *G. libatrix*, and one *P. tremula*, the last, unfortunately, turning out to be ichneumonid. An enterprising specimen of *Oporabia filigrammaria* emerged in the pupa-cage (kept outside) on June 27th—a further proof of the early character of the season.—FRANK LITTLEWOOD.

(To be continued.)

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, April 3rd, 1912.*—The Rev. F. D. Morice, M.A., President, in the Chair.—The following gentlemen were elected Fellows of the Society:—Mr. Henry Hacker, Queensland Museum, Bowen Bridge Road, Brisbane, Queensland; Mr. Cyril Engelhart Latour, Port of Spain, Trinidad, British West Indies; Signor Orazio Querci, Macerata, Marche, Italy. — The Council having been invited to elect Delegates to represent the Society at various functions, the following had been elected:—For the Centenary Celebration of the Philadelphia Academy of Natural Sciences, Professor Comstock and Dr. Holland; Professor Fernald, who had also been elected, was unable to attend; for the First Eugenic Congress, in July, Professor Bateson; for the 250th Anniversary of the Royal Society, in July, the President; for the International Congress of Entomology, in August, the President, the Rev. G. Whooler, Secretary, and Messrs. G. T. Bethune-Baker, H. Rowland-Brown, and the Hon. W. Rothschild.—Mr. G. T. Bethune-Baker exhibited a specimen of *Cyclopodia hopei*, Westw., a parasite on the Indian flying-fox, this was itself parasitized by an Acarid of the genus *Gamasus*, there being no less than seventeen of this small species on one specimen of *C. hopei*.—There being no other exhibits and no papers to be read, the President said that he thought it would be a good opportunity to discuss the important subject of Nomenclature, and a long discussion took place in which many of the Fellows present took part. Eventually Mr. Turner proposed that a small Committee be appointed to consider the subject of Nomenclature and report to the June meeting, with a view to the coming International Congress. This was seconded by Mr. A. E. Gibbs, and carried *nem. con.* The following Fellows were proposed as forming the Committee, and the names being put from the Chair were unanimously accepted:—Mr. G. T. Bethune-Baker, Dr. T. A. Chapman, Messrs. J. H. Durrant, H. J. Turner, C. O.

Waterhouse, and Rev. G. Wheeler, with power to add to their number.—GEORGE WHEELER, M.A., *Hon. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—*January 3rd.*—*Annual Meeting.*—Election of Officers for 1912.—Mr. W. Buckley gave the Presidential Address for the year—"Entomology and the Microscope," and illustrated his remarks with a large number of beautiful slides.—Mr. J. H. Watson exhibited *Saturnia cephalaria* var. *harversoni*, from Higher Arinenia; in a pupa kept for two years he had found a living dipterous parasite.—Mr. R. N. Earwaker showed the larvæ (feeding on the fungus *Polyporus radiatus*) and the imago of the beetle *Orchesia micans*, from Cheltenham.—Mr. B. H. Crabtree showed a series of *Luperina gueneei*.—A. W. BOYD, M.A., *Hon. Secretary.*

RECENT LITERATURE.

British Butterflies. By A. M. STEWART. London: Adam & Charles Black. 1912. Pp. i-viii, 1-88. (Peeps at Nature Series. Edited by Rev. C. A. HALL.)

ALTHOUGH this little book deals with a subject already much and often handled, we venture to say it will admirably fill a place not yet occupied. It contains some ninety pages of attractive letterpress, not overburdened with detail, but nevertheless setting forth all that is necessary to the tyro. One could only wish that the life-histories had been more fully dealt with in some species. The eight coloured plates produced direct by the three-colour process are really marvellously well executed, and lose nothing in being somewhat reduced; they should entirely do away with any difficulties of identification—even those of the merest novice. It is easy to see that the introductory chapters are the work of a thoroughly practical entomologist; but we should have liked to see the tracing-cloth method of setting at least mentioned, being as it is at least as rapid and quite as effective as the Paisley method.

N. D. R.

How to Use the Microscope; a Guide for the Novice. By the Rev. C. A. HALL. London: Adam & Charles Black. 1912. Pp. i-viii, 1-88.

THIS useful little book on the microscope is apparently uniform with the 'British Butterflies' already noticed, and equally well got-up. Although the twenty plates, taken direct from photo-micrographs, are of course none of them in colours, yet, taken in conjunction with the drawings in the text, they cover a sufficiently wide and varied range of subject to interest the uninitiated, for whom the book is intended, in at least a few branches of the science of microscopy. The text, too, contains a wealth of useful advice and instruction, and we are glad to see a very large proportion of it has been devoted to the explanation of the apparatus necessary and of its uses, and also of the chief methods of preparation. These, after all, are the points upon which the novice needs help; for the application of them he can usually be trusted to look after himself. We heartily recommend the book.

N. D. R.



Fig. 1.

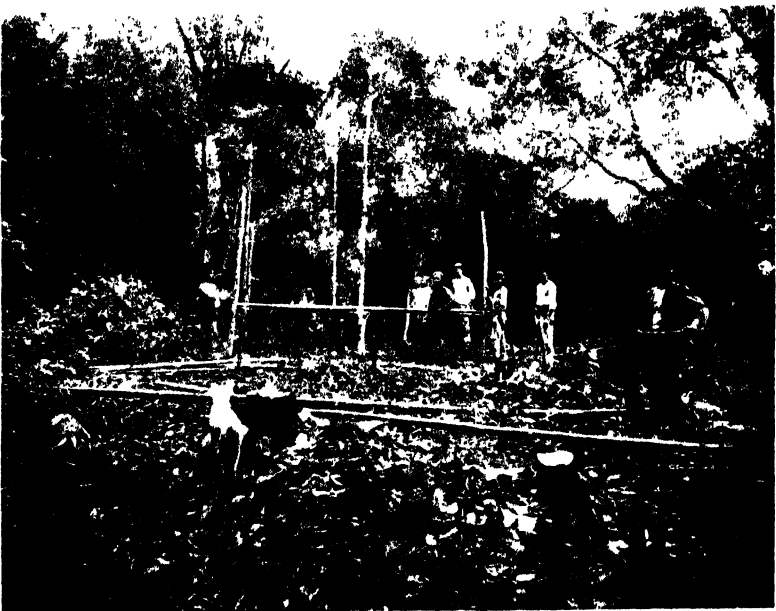


Fig. 2.

"WHERE WALLACE TROD."

THE ENTOMOLOGIST

VOL. XLV.]

AUGUST, 1912.

[No. 591

"WHERE WALLACE TROD": BEING SOME ACCOUNT OF AN ENTOMOLOGICAL TRIP TO MT. SERAMBU, SARAWAK, BORNEO.

By J. C. MOULTON, B.Sc., F.L.S., F.Z.S., F.E.S.,
Curator of the Sarawak Museum.

(PLATES V. & VI.)

Just as the Galapagos Isles will always be famous for the birth of Darwin's great theory of Natural Selection, just as Ternate will always share this fame as the birthplace of the same idea to Wallace, so too, should Sarawak be remembered in connection with Wallace's earlier essay on the Origin of Species,* which foreshadowed that written three years later in Ternate, and read before the Linnean Society in conjunction with Darwin's essay in 1858.

During Wallace's travels in the Malay Archipelago, lasting over eight years, the great naturalist spent fifteen months in Sarawak, nine of which he spent at Simunjan, which he describes as the best collecting-ground for insects found in all his travels, and, as most readers will remember, he gives some astonishing figures to illustrate this. Besides this, he also spent four weeks on a mountain called Serambu, not far from Kuching, the capital of Sarawak; this was from December, 1855, to January, 1856. His essay was written in February, 1855, at Santubong, the Sarawak seaside resort, and was published in September, 1855. As he tells us in his 'Life,' 1905 (p. 354), through many evenings and wet days in solitude he used to "ponder over the problem which was rarely absent from my thoughts," and there is little doubt that the quiet time spent on Peninjau (a spur of Serambu) enabled him to put in many quiet hours of wrestling with the all-absorbing riddle. It was therefore with feelings of the liveliest interest that I first beheld Mt. Serambu, just three

* "On the Law which has Regulated the Introduction of New Species," published in 'Annals and Magazine of Natural History,' September, 1855, and reprinted as Essay I. in 'Contributions to the Theory of Natural Selection,' by the same author, 1870.

years ago (February, 1909), and had soon determined to go to that mountain, find the very spot, if possible, where Wallace lived, spend the same months there as Wallace did, and devote myself to catching insects just in the same way that he did. To hopes of thinking out another epoch-making theory I did *not* aspire, but I did hope that my collection of insects would not fall far short of those recorded by him, and in this I was not disappointed. Circumstances prevented me from going to Serambu until January of this year (1912), and it was with the keenest anticipation that I started from Kuching at 3 p.m. on January 19th in the Borneo Company's little steam-launch 'Patricia.' My companions for the trip were Mr. Harrison W. Smith, who was as desirous as I "to step where Wallace trod," two museum collectors (Sea-Dayaks), two Land-Dayaks, and our two Chinese boys. A three hours' journey up-river in the launch brought us to Busau, once a populous place on account of the antimony works. From here we walked some three or four miles to a place called Paku, where we had arranged to spend the night in the Government bungalow. Unfortunately, as the sun set soon after 6 p.m., we soon found ourselves stumbling along a slippery path in the dark, which was made no nicer by a heavy downpour of rain. Our luggage and retinue followed on little trolley-cars, arriving about 10 p.m., after successfully negotiating sundry little differences of opinion between the car and the line, which, while adding character to the line, at the same time serve to distinguish it from our memories of the London to Bath portion of the Great Western Railway.

At Paku the mountain faced us due east, and we learnt that there were two sites of former bungalows, one to the south, where a resident of this district used to spend some days, and the other on the northern end of the mountain on a spur called Peninjau; this was the site of the old bungalow built by the Rajah. The Dayaks who had come down to fetch our baggage explained that nothing was left of either of these bungalows, and that both sites were all overgrown, especially the latter, which they said was indistinguishable now from the old jungle. However, this last was our objective, so off we started that morning, and after an hour and a half of hot walking we came to a Dayak village on the lower slopes of the mountain; here we deposited our baggage, and, taking three men with us, Mr. Smith and I proceeded on up to "explore," or rather to see how far the Dayaks could be believed in their account of the place. Just above the village the path lay over some huge boulders, and these had been bridged by a series of bamboos placed end on; some of these were notched to give a foothold, others were not; to some were attached hand-rails, to others not. Having respectfully and successfully negotiated this portion of the Dayak

highway, we came by a steep but easier path to a deserted village, which, situated as it was on the steep slope of the hill, surrounded by the stately trees characteristic of old jungle, and itself overgrown by a quick-spreading green garment of creeper and undergrowth, made a pretty picture, and my friend was not slow to take the opportunity of photographing it. A few minutes further brought us to the end of our journey—a fine mangosteen tree loaded with some of the most delicious fruit imaginable. Our Dayak guides said this was where the bungalow used to be, and after a little search we discovered the six posts on which the raised floor had rested; between them grew a fine young tree just three feet in circumference at the base, and the whole place was, as the Dayaks had said, just like ordinary jungle. Except for those six posts and two boards used for steps, not a trace of the bungalow was left.*

We returned that afternoon and slept the night at the Dayak house. Next morning we ascended the hill again, this time accompanied by twenty-one Dayaks, who, after carrying up our baggage, spent some hours clearing the site and building us a house. This was built on much grander lines than is usual for these jungle shelters, and for those unacquainted with this style of domicile the following details may be of interest:—Six poles were first driven into the ground, three to mark each end of the house, which then measured 13 ft. × 10 ft. Two feet above the ground poles were tied across these ends, and others laid at right angles to them, supported by more cross poles on forked stakes underneath. Bamboos were then laid close together to form a floor, while the walls were formed of the same useful material split lengthwise, and then more bamboos laid across the top supported our "kadjang" roof.† We were a bit short of these "kadjangs," but luckily my friend had brought a tarpaulin, so we were able to make our little hut very fairly watertight.

* Wallace's description of his visit there is given in his 'Malay Archipelago' (10th ed. 1902, pp. 63-67). I quote the following lines descriptive of the place:—

"This is a very steep pyramidal mountain of crystalline basaltic rock about a thousand feet high, and covered with luxuriant forest. There are three Dayak villages upon it, and on a little platform near the summit is the rude wooden lodge where the English Rajah was accustomed to go for relaxation and cool fresh air. It is only twenty miles up the river, but the road up the mountain is a succession of ladders on the face of precipices, bamboo bridges over gullies and chasms, and slippery paths over rocks and tree-trunks and huge boulders as big as houses. A cool spring under an overhanging rock just below the cottage furnished us with refreshing baths and delicious drinking water, and the Dayaks brought us daily heaped-up baskets of Mangusteens and Lansats, two of the most delicious of the subacid tropical fruits."

† "Kadjangs" are palm-leaves sewn together in a large square; they are in continual demand for hut and boat coverings—in fact, anything which wants a temporary protection from the rain; they cost about fourpence each.

Except for the "kadjangs" and tarpaulin which we brought from Kuching, all the materials for the house (which contained no nail or cord) were provided by the jungle.

A little way below the house was a huge overhanging rock, under which trickled a tiny stream; a bamboo split down the middle formed an excellent water-pipe, carrying the water to a place under which we could stand and bathe.

Mindful of Wallace's warnings in the Malay Archipelago, and knowing from my own experience how difficult it is to catch moths in a native-made hut roofed with leaves, I brought some old packing-cases from Kuching, and these were brought up the hill in sections by Dayaks. When put together and given a coat of whitewash they formed a very serviceable moth-trap. The rough measurements of it were: 7 ft. high; across open front, 4 ft.; across back (boarded), 2 ft.; sides, 4 ft.; a good reflector lamp placed on a split bamboo inside this kept us well supplied with moths each night.

According to our aneroids, the height above the sea-level for this place was just under 1000 ft., and the summit of Mt. Serambu was 1340 ft. The temperature in the shade of our hut averaged between 71°-77° Fahr.; on one cold afternoon it went down to 69°, and for two days it never went above 73°. These temperatures were almost suggestive of the North Pole after those registered at Kuching, where 80°-90° is the usual range, with an occasional rise to 96°. As the wet monsoon lasts from October to March, we could hardly expect to have other than a wet spell in January for our trip, and for the last portion, at all events, of our stay there we had our full share of wet weather, which accounts for the relatively small number of insects caught in the daytime, although it made no difference to the numbers captured at night.

On the 21st we spent our first night on the spot where Wallace had dwelt just fifty-six years before. Jungle life has been described so often before that there is no need for me to detail ours, though let me remark that the best accounts give but a very small idea of the unique charm of life in such surroundings. With the exception of a visit paid by Mr. Smith and myself to some caves in a neighbouring hill, our party spent just a fortnight collecting on and round this place. Mr. Smith unfortunately contracted fever, and had to return to Kuching on the 29th. The remainder of us stayed up there until February 2nd, descending on that day by the Peninjau side to Siniawan, which was a good deal shorter than the Paku route.

All inquiries of the older Dayaks failed to elicit any positive recollections of Wallace's visit here. All they remembered was that the first Rajah, Sir James Brooke, had a bungalow built on this site (which site, by the way, they say he purchased from the Peninjau Dayaks for one cannon), and that he came here often

accompanied by European friends,* and that the present Rajah, Sir Charles Brooke, did the same. Only a few remembered the Chinese rebellion in Sarawak, which took place in 1857, and recollections of that great event seem to have swamped all memories of events before it; so that Wallace's visit in January, 1856, must now be relegated to that great host of events which took place in the irreclaimable past no longer within the memory of man.

“Eheu fugaces, Posthume, Posthume,
Labuntur anni.”

(To be continued.)

NOTES ON THE BRITISH MOSQUITOS (CULICINÆ).

By F. W. EDWARDS, B.A., F.E.S.

(Published by Permission of the Trustees of the British Museum.)

(Continued from p. 195.)

3. *O. annulipes*, Mg.—Proboscis with a rather ill-defined pale band in the middle. Head scales yellowish. Scales of mesonotum dark brown in the middle, rather bright yellow at the sides. Segments of abdomen with yellowish basal bands, covering nearly half of each of the segments 3–5, but narrower on the remaining segments; apical portion of segments mainly dark brown, but with scattered pale scales. Wings and legs speckled with light and dark scales, but femora nearly all yellow behind. *O. annulipes* is very much like *O. maculatus* in general appearance, but can be distinguished in the female sex without much difficulty by the characters given in the key. The males are more easily separated by the structure of the genitalia. Rough figures of the genitalia of both the species are given. In *O. annulipes* (fig. 1) the harpes (basal appendages) are long and strap-shaped, and in *O. maculatus* (fig. 2) they are shorter, and provided with a large membranous expansion near the tip. Average length, 7–8 mm.

The British Museum possesses specimens from Angmering, Sussex (*Rev. A. E. Eaton*); Longner Hall, Shrewsbury (*R. F. L. Burton*); and Rollesby, Norfolk (*G. H. Verrall*).

I have no doubt that this species is correctly named, as it answers quite well to Meigen's description. Ficalbi, however, states that the

* Sir Spenser St. John visited the place in 1851–2, spending some months there in all (see his 'Life in the Forests of the Far East,' 2nd ed. 1868, vol. i. pp. 162–169). Ida Pfeiffer visited the Dayak villages on Serambu in December, 1851 (see her account of it in 'A Lady's Second Journey round the World,' 1856, pp. 50–55). The distinguished botanist, O. Beccari, spent a week there in 1865 (see his 'Wanderings in the Great Forests of Borneo,' 1904, pp. 54–60).

abdomen is entirely yellow; this may very likely be a variation of our British species, or it may be another nearly allied form. A similar variation—*i. e.* the reduction in the number of dark scales on abdomen and wings—occurs in *O. nemorosus*. Ficalbi's *C. annulipes* has been redescribed from Finland by Theobald as *C. flavescens*, and Blanchard has renamed it *C. arcanus*. M. Goetghebuer records *C. annulipes* from Belgium (Ann. Soc. Ent. Belg. 1910, p. 84), but states that the female has simple claws and median rings on the metatarsi. Perhaps his species is *T. richiardi*, Fic.

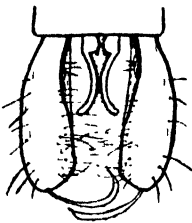


Fig. 1.



Fig. 2.

Fig. 1.—*Ochlerotatus annulipes*, Mg. Male genitalia (diagrammatic).

Fig. 2.—*O. maculatus*, Mg. Male genitalia (diagrammatic).

4. *O. maculatus*, Mg.—Thoracic scales mainly dark brown, but a variable number of yellowish white ones are present. These latter are usually found on the margins of the mesonotum, in front of the scutellum, and as a pair of thin pale lines of variable length, sometimes reduced to a pair of rather prominent whitish spots near the middle of the thorax. Pale bands of abdomen often very indistinct in the female, represented by median basal spots on some or all of the segments; the whole dorsal surface of the abdomen, like the wings and legs, is speckled over with pale scales. Average length, 7–8 mm.

Widely distributed and probably common.

Synonymy.—This species is usually known as *Culex cantans*, Mg. Meigen, however, states that his previously described *C. maculatus* is only the male of *C. cantans*. Stephens's *C. fumipennis* is generally accepted as a synonym of *C. cantans*, but I think wrongly. Stevens stated that the "white rings at the base of each joint of tarsi" were "nearly obsolete"; this would apply very well to *T. morsitans* or *T. theobaldi*, but not to *O. cantans*. As, however, it would be impossible to decide which of these two *Theobaldias* Stephens had, and as no British species known to me can be said to have the "wings obscure," I do not revive this old name. Theobald's *Culicada waterhousei* is certainly only *O. maculatus*, as the genitalia of the type (though not of the figure) agree well with those of typical *maculatus* as figured by Meijere, and roughly in this paper. *C. waterhousei* agrees with all other British *Ochlerotatus* except *O. lateralis* in having the hind claws toothed.

5. *O. salinus*, Ficalbi.—Proboscis and palpi dark brown with scattered pale scales. Scales of thorax uniformly reddish brown. Abdominal segments with distinct basal pale bands, dark brown on the apical three-fourths, with numerous scattered pale scales. Wings and legs (even the tarsi) speckled with light and dark scales. Average length, ♂ 6·5 mm., ♀ 5·5 mm.

Apparently chiefly a sea-coast species; the British Museum specimens are from Worthing (Rev. A. E. Eaton); Walton-on-the-Naze, Essex; Studland, Dorset, and Torpoint, South Devon (Lt.-Col. Yerbury); Dartford, Kent (F. W. Terry).

Synonymy.—This species was originally described by Ficalbi as distinct from *O. nemorosus* owing to the absence of silvery-white knee-spots, which, according to the descriptions of Meigen and Schiner, characterise *O. nemorosus*. Subsequently Ficalbi examined a specimen of *O. nemorosus* named by Schiner in which the pale knee-spots were not silvery-white, and so sank his *C. salinus* as a variety, differing from *nemorosus* in the genitalia. I feel sure it is a totally distinct species, both by coloration and habitat. In the writer's synopsis of African Culicidæ this species is wrongly referred to as *O. nemorosus*. Theobald's *Culicada terriei*, described from a single specimen, is nothing but a small specimen of this species.

6. *O. diversus*, Theo.—Scales of head and thorax mostly yellowish brown; on the thorax are a median pair, almost touching in the middle line, and a short lateral pair of longitudinal dark brown stripes. Proboscis and palpi dark brown, with very few light scales. On the wings the light scales are practically confined to the mediastinal vein. The legs are less speckled than in *O. salinus*; the femora are entirely yellowish behind, except at the extreme tip; the tibiæ are mostly pale; the last four joints of the tarsi entirely black-scaled. Average length, 6–7 mm.

Apparently a common species.

This species answers in many respects to Ficalbi's description of what he takes to be the *C. ornatus* of Meigen, and it is certainly difficult to believe that it should have been undescribed until 1901. But Ficalbi's description does not correspond with the colouring of the abdomen found in British specimens, and I have been unable to satisfy myself that *O. diversus* has been described under any older name. Theobald's *C. nemorosus* var. *luteovittatus* is, however, a synonym, as I have proved by comparison of the types.

7. *O. nemorosus*, Mg.—Head scales rather light yellowish brown; thoracic scales forming a broad deep brown band in the middle, extending almost to the scutellum; at the sides of this band, which is usually quite sharply defined, the scales are concolorous with those of the head. The pale bands of the abdomen are rather variable in shape, but always tend to be contracted in the middle (or expanded at the sides). The apical dark brown portions of the segments are entirely without any

pale scales. The femora are pale behind and over the greater part of the basal half, dark in front and above. Tibiæ and tarsi usually entirely dark brownish black, but there may be pale scales on the tibiæ and metatarsi. Wings entirely without pale scales. Average length, ♂ 6·5 mm., ♀ 5·5 mm.

A common sylvan species. Very abundant at Oxshott, Surrey; and at Studland, Dorset ("very venomous," according to Lt.-Col. Yerbury). I have also seen specimens from the New Forest; Burnham Beeches; Tophins (Aberdeen); North Sutor (Cromarty); Nethy Bridge (Inverness), &c.

Synonymy.—This species is without any doubt the *Culex concinnus* of Stephens, a name which, for some unexplained reason, has been omitted from all the catalogues. Curtis's *C. guttatus* has been commonly regarded as synonymous with *O. nemorosus*, but the figure plainly shows that it is not this species, but *O. lateralis*. The form which Theobald calls var. *detritus* (Hal.) is really typical *nemorosus*; Haliday himself stated that his *C. detritus* was only *C. pipiens*, but a specimen in the British Museum collection, named *C. detritus* by Walker, is really *O. lateralis*. Dr. S. Bengtsson very kindly sent me specimens of three of Zetterstedt's species (*C. fuscus*, *C. nigripes*, and *C. nigritulus*) to examine; those of *C. fuscus* seemed to be very much rubbed specimens of this species, and though the descriptions do not correspond, *C. fuscus* may probably be taken to be a synonym of *C. nemorosus*. One of Zetterstedt's specimens showed traces of pale bands on the abdomen. *C. nigripes*, Zett., is extremely similar, but the scales of the head and thorax are all very deep brown, except for a few in front of the wing-base, which are whitish. Theobald's *Culicada sylva* (originally described from two New Forest specimens as a variety of *C. nigripes*) is probably this species. Mr. R. C. Bradley has kindly re-examined the types for me; he says that the hind claws of the female are distinctly toothed, and indicates that the cross-veins are separated by nearly the length of the posterior. Thus the two main characters by which this specimen was supposed to be distinguished are not really present. The palpi of the male are described as being a little shorter than the proboscis, a character found in *O. lateralis*; the other characters of this male (a worn specimen) do not, however, correspond with those of *O. lateralis*.

8. *O. lateralis*, Mg.—Scales of head mostly whitish, but two large patches of black ones. Thorax black; sides broadly whitish, a line of whitish scales down the middle, and several short lines of the same colour in front of the scutellum. Abdomen violet-black above, with conspicuous white lateral spots. Legs black; basal half of hind femora yellowish-white; distinct silvery-white knee-spots. Wing-scales all dark. Hind claws simple. Male palpi a little shorter than the proboscis, and scarcely swollen at the apex. Average length, ♂ 5 mm., ♀ 6·5 mm.

Common in the South of England.

Synonymy.—This is the species described by Curtis as *Culex guttatus*, and by Rondani as *C. albopunctatus*.

(To be continued.)

BRITISH NEUROPTERA, 1911.

By W. J. LUCAS, B.A., F.E.S.

WITH the advent of the new year the Neuropterist may commence out-door operations, and the capture of more species than one may at once reward him for his trouble. On January 29th I met with my first example in 1911—a specimen of *Hemerobius stigma* (one of the Brown Lace-wings), which was beaten from a small Scotch-fir by the margin of the Black Pond on Esher Common, Surrey. The species is, however, continuous as an imago, and I believe I have taken it in that condition in every month of the year.

Of the *Sialidæ* (Alder-flies) I have but one record, a male of the common *Sialis lutaria*, which was taken at Lochinver in Sutherland by Col. J. W. Yerbury on June 23rd.

Personally I made no captures of the *Raphidiidæ*, though I sought for specimens near the Black Pond, Esher, on June 4th, and found pupa skins. These insects seem to be upon the wing for quite a short period. Lieut.-Col. Nurse, writing on June 8th, said that he found a pupa and two larvæ of *Raphidia notata*. The latter two duly pupated, but unfortunately they were thrown away by mistake. He also obtained a small larva of *Raphidia* in a spruce-fir cone. In May Mr. G. B. Oliver of Wolverhampton sent me a living female of *R. xanthostigma* and a pupa-case, saying that the imago was found on the 14th of the month, apparently freshly emerged, near the empty case on an oak-trunk in Sutton Coldfield Park. Later he sent me another living female, which fell from oak when he was larva-beating on June 6th at Sutton Coldfield. This species closely resembles the much scarcer one, *P. cognata*.

Next come the *Hemérobiidæ*. While I was on a visit to the New Forest in April, Mr. D. Sharp caught in Blackwater near Rhinefield, and gave to me, three larvæ of *Osmylus chrysops*, the finest of our Neuroptera. After I had left the Forest he wrote to me on May 13th, saying:—"I have been able to get only one more larva of *Osmylus*. It appears to be an amphibious insect, not aquatic; it runs, not swims. It puts out from behind two delicate tubes, armed with some curious processes. I do not recollect having seen any special remark concerning them. The figure in the Cambridge Natural History shows them, but it is a poor figure, and the antennæ too are different from those of my specimen. I think the tubes assist in locomotion, but this can scarcely be their primary function." Of *Sisyrus fuscata*, the interesting little creature whose larva feeds in freshwater sponge, I have two records. One specimen was taken at Lochinver on July 11th by Col. Yerbury, and another was captured at Barnham in Suffolk by Lieut.-Col. Nurse.

Of the typical genus *Hemerobius* (Brown Lace-wings) a number of species have been noted:—*H. micans*, three at Ampton, Suffolk (Nurse). *H. nitidulus*, May 21st, Oxshott, Surrey, (W. J. L.); five at Ampton and Troston, Suffolk (Nurse). *H. humuli*, in Sutherland, three at Lochinver, June 23rd, and one at Loch Assynt, June 2nd, a very dark form (Yerbury); two at Ampton (Nurse). *H. lutescens*, four at West Stow, Suffolk (Nurse). *H. orotypus*, two at Spey Bridge, July 31st, and one at the same place, August 2nd (Yerbury). *H. nervosus*, four at Spey Bridge, July 31st, one at Lochinver, June 27th, one at Grantown-on-Spey, August 17th, and one at Loch Assynt, June 9th (Yerbury); four at Ampton (Nurse). *H. subnebulosus*, one sent me about May 5th, caught by Mr. P. Richards in his garden at Kingston-on-Thames, where there was a fir-tree. *H. stigma*, Esher Common, January 29th, and Oxshott district, May 21st (W. J. L.). *H. concinnus*, Esher Common, June 4th (W. J. L.).

Three species only of the family *Chrysopidæ* (Green Lace-wings) have been noted, and all belong to the typical genus *Chrysopa*. *C. flava*, one in the evening of July 17th in a garden at New Malden, Surrey. *C. septempunctata*, an example caught in Surbiton, Surrey, May 27th (A. Dadswell). *C. perla*, Esher Common, June 4th (W. J. L.).

We now come to the last family, *Panorpidæ* (Scorpion-flies). The first noticed were a male and two females of *Panorpa germanica*, May 21st, in the Oxshott district. A number of specimens of the same species were taken by Col. Yerbury in the north of Scotland—one male at Dingwall, May 27th; two males and a female at Dingwall, May 29th, when they were in fair numbers; one female, July 12th, at Lochinver. These Scotch specimens form a nice series, extending from the normally spotted condition to a practically immaculate form, not unknown from the same region. Lieut.-Col. Nurse captured the species at Ampton, a teneral female, May 12th, and another female on May 18th; at Timworth, West Suffolk, a teneral female, May 21st, and two males and a female, mature, on the same day; also at Timworth, a male, June 15th, two males and a female, May 30th, and a female, August 27th; at Bradfield, West Suffolk, three males, May 23rd. Mr. E. Whitehead took it at Hollingworth Lake, Smithy Bridge (? Cheshire) on June 20th. *P. communis* was taken (a female) near Oxshott, on July 2nd, and a female in the New Forest on August 2nd (W. J. L.); at Reach Ditch, Cambridgeshire, three females, July 11th; at Chippenham, Cambs, a male, June 16th, and at Timworth in August a brownish male (Nurse); in Delamere Forest, Cheshire, July 3rd (Whitehead). *P. cognata* was taken at Livermore, West Suffolk, a male and a female, July 2nd [and two males and a female, August, 1905, at Timworth] (Nurse). The uni-

colourous rostrum, the shape of the antepenultimate segment of the abdomen, and the form of the appendages. very clearly pointed to this, the scarcest of our species of *Panorpa*.

Notes on British Neuroptera (as well as on British Orthoptera and Odonata) during 1912 will be welcomed by the author of this note.

Kingston-on-Thames: June, 1912.

A NEW STRAWBERRY APHIS.

By FRED. V. THEOBALD, M.A., F.E.S., Hon. F.R.H.S., &c.

Myzus fragariae, nov. sp.

Apterous Viviparous Female.—Very pale green, often semi-transparent. Head, thorax, and abdomen covered with capitate hairs. Antennæ as long as the body; basal segment rather large, with a thick blunt swelling on the inner side; second segment small; third long, not quite as long as the next two, which are equal; the sixth longer than the fourth and fifth; the first with several, the second with two large and some small capitate hairs, the third with one or two on the inner side. Cornicles long and thin, almost transparent, with faint incrassation; projecting some distance beyond the cauda. Cauda pallid green, with two pairs of lateral hairs and a median apical one. Legs pallid green, almost transparent; tarsi slightly dusky; femora and tibiæ with capitate hairs. Eyes blackish.

Length, 1-1.5 mm.

Winged Viviparous Female.—Head dark brown; antennæ dark brown. Prothorax pale yellowish green; mesothorax with dark brown median area. Abdomen pale yellowish green, with a dusky patch on the apical half, and a few small dusky spots on the basal segments and dusky lateral spots. Legs pale yellowish green, apices of femora and tibiæ dusky, tarsi dark. Cornicles pale yellowish green. Wings with smoky black veins and smoky black stigma. Capitate hairs scantier than in the apterous form, four on the front of the head, some on the two basal antennal segments, and short ones on the body, the heads being only slightly swollen. Third antennal segment with 32-36 sensoria disposed all along it, fourth with 5-8 sensoria; third segment about as long as the fourth and fifth, sixth a little longer than the fourth and fifth; cornicles showing faint incrassation, not projecting beyond the pale green cauda, which has two pairs of lateral hairs and one median apical one. A marked papilla on the under wings with five curved apical bristles.

Length of body, 2-2.5 mm.; of wings, expanse, 4 mm.

Food-plant.—Cultivated strawberries.

Habitat.—Hounslow, Middlesex, and Rudgwick, Sussex.

Observations.—Described from a colony sent me by the Board of Agriculture in March. At first the apterous females only occurred under the leaves; later they and the nymphs swarmed

up the leaf-stalks as well. Pupæ occurred on March 29th, many on April 4th, and winged females commenced to appear on April 10th. The apterous females resemble *Myzus ribis*, but the alate forms are very distinct, having green cornicles and different abdominal ornamentation. Some of the alate females appear to have five, some three, curved bristles on the papilla on the under wings. I also found it swarming on hothouse strawberries in May at Rudgwick and doing much damage. A succession of winged broods kept on appearing until mid-June.

METRIOPTERA ROESELII.

By W. J. LUCAS, B.A., F.E.S.

YET another record of this somewhat elusive grasshopper has come to hand. Mr. W. West, of Lewisham, Curator of the South London Entomological Society's Collections, when working for Coleoptera and Homoptera, makes a point of not neglecting "other fish that come to his net." Consequently he has



M. roeselii ($\times 3$).

W. J. Lucas, photo.

more than once been able to help those who work at the Orthoptera. They have now to thank him for adding another locality to the two or three that we already possessed for *M. roeselii*.

On September 3rd, 1911, he took five specimens, three males and two females, in a reed-patch on the bank of the Thames, a few miles below Gravesend. They were not recognised at the moment, but Burr's description enabled Mr. West to identify them. Two pairs are placed in Mr. West's collection, and the

odd specimen he has been kind enough to add to mine. All five were exhibited at a recent meeting of the South London Society. As August and September are the best months for the species, a magnified figure of the male accompanies this record, as well as a table for the purpose of naked-eye recognition in the field, since the species may easily be confused at first sight with the far commoner *M. brachyptera*. A third much larger species, *M. albopunctata* (= *grisea*), occurs in damp spots on cliff sides, but it is not likely to be mistaken for either of the other two.

M. brachyptera.

1. Size slightly smaller.
2. Colour dark, usually marked with green.
3. Pronotum — flat dorsal part rather narrower.
4. Pronotum—posterior margin of lateral flap pale.
5. Elytra pointed.
6. ♀ Ovipositor long, scarcely angled at base, upper edge of blade curved.
7. ♂ Cerci less prominent, tooth near middle of inner edge.

M. roeselii.

1. Size slightly larger.
2. Colour somewhat ruddy, without green markings.
3. Pronotum — flat dorsal part rather broader.
4. Pronotum — total margin of lateral flap pale.
5. Elytra rounded or even truncate.
6. ♀ Ovipositor about two-thirds that of *M. brachyptera*, with a sharp bend at base, upper edge of blade more nearly straight.
7. ♂ Cerci more prominent, tooth nearer tip of inner edge.

The male figured was taken on the Essex coast by Mr. B. S. Harwood, September 3rd, 1908.

Kingston-on-Thames: July, 1912.

DESCRIPTION OF THE EGG OF VANESSA POLYCHLOROS.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

APPARENTLY there is no reliable description of the colouring of the egg of *Vanessa polychloros* published, and respecting all the works on British butterflies I have referred to very little is to be found, and that is unreliable. Tutt says ('British Butterflies,' p. 341):—"The fiction derived from a figure by Sepp, published nearly one hundred and forty years ago, that the eggs

of this species and that of *V. urticae* are very dissimilar is to be found in almost every text-book on butterflies that has been published in this country. They are, on the contrary, very similar." Barrett gives no description of the egg. Mr. South ('British Butterflies,' p. 66) describes the only eggs he obtained as "purplish with whitish ribs, but no caterpillars hatched from them. Hellins, who squeezed a few eggs from a freshly killed female, states that the colour is apparently a dull green."

Having obtained two batches of eggs of *V. polychloros* from specimens captured on April 6th last by the Hon. N. Charles Rothschild and Mr. C. Granville Clutterbuck, I am indebted to both these gentlemen for kindly sending the butterflies direct to me; thereby I have been enabled to note the colouring of the egg from the time of deposition to that of hatching.

One of the three females received I sent to Mr. L. W. Newman on April 13th, which deposited a large batch of eggs (about two hundred and twelve) during a gleam of sunshine the following morning; these he at once kindly sent to me, which arrived on the 15th. These I figured when twenty-four hours old; they were then of an apricot-buff colour. These I returned to Mr. Newman, who tells me they hatched on May 6th, remaining in the egg-state twenty-two days.

The second female died on April 23rd without depositing. Upon dissection I found her full of eggs, apparently ready for laying; they were of a clear yellow-ochre colour, of the same hue as when first laid.

The third female, which I kept under constant observation, and fed her about every other day, laid a batch of about one hundred and twenty eggs on sallow between 1 p.m. and 2.30 p.m. on April 20th. These eggs began hatching on May 7th, remaining eighteen days in the egg-state. When first laid (directly after) the colour is a pure yellow-ochre, which changes to apricot-yellow when twenty-four hours old. They very gradually assume a slightly duller colour by the third day, and by the fifth day are dull ochreous-buff. Very gradually the colour increases in depth to amber-brown when a week old; the white keels give the entire batch a drab appearance to the naked eye. Under microscopic power the ground colour is amber, checkered with underlying chestnut-red markings caused by the maturing of the larva.

After remaining for a few days the basal half assumes a more ochreous hue, while the apical half turns duller, and finally the ground colour becomes pale ochreous, the dark hairs of the larva showing through the transparent shell, and the black head covers the greater part of the crown; this, combined with the white keels, gives the eggs a dull purplish effect.

The egg is $\frac{3}{8}$ in. high and dome-shaped. The micropyle is flattened and very finely reticulated. There are from seven to

nine longitudinal keels, which rise on the crown, where they are much elevated, but rapidly decrease in height on traversing the side, and form only a slight ridge over the basal half; they are fluted, and resemble white frosted-glass frills, but are only white on the upper half. The usual number is eight, occasionally only seven, and sometimes nine. The spaces between the keels are delicately ribbed transversely by about forty in number.

As will be seen by the above, the egg of *V. polychloros* is not green in any stage either before or after it is laid, and in this respect, and in structure also, it is not similar to that of *V. urticae*, but agrees closely both in structure and colour with its near ally, *V. antiopa*.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S., &c.

(Continued from p. 204.)

JULY 31st was fine, bright, and very warm. In the evening I went to the woods and tried sugar. There was a clear sky, small moon, slight dew, and the air was calm and close. Moths were abundant, but mostly common species. *Apamea oculea* swarmed and was in great variety; others were *T. orbona*, *T. ianthina*, *N. baja*, *M. abjecta* (two), *C. affinis*, *C. trapezina*, *N. rubi* (second brood), *G. libatrix*, *A. pyramidea*, *H. nictitans* (one, a rare moth here), &c., and one *Dichelia grotiana*. *T. amataria* was flying in great numbers over *Chenopodium*, &c., in the rides. One *H. micacea*, six *H. paludis*, and two *C. matura* were captured at light.

The first day of August was fine, bright and hot until 6 p.m., when it clouded over, and there was a little rain between seven and eight. I bred *Zephyrus betulæ* (from Monk's Wood larvæ) and *Catocala nupta*. I went to the reed-beds at dusk and took sixteen *N. arundineta* and one *S. maritima*, but they were too worn for the cabinet, so were released in the morning, and I hope were able to find their way back to the reeds. *Nonagria geminipuncta* was just appearing, and I netted seven very fresh specimens; also one *Orthotælia sparganiella*, the first I have taken here. The 2nd was fine, bright, and warm, with fresh south-westerly breeze. The second brood of *Pararge megæra* was just coming out, and I saw six or seven; also a fresh and very abundant brood of *Lycæna icarus*, and noticed several fresh *Chrysophanus phlæas*, the first I have seen this year. I obtained the following from the electric lights at Parkeston:—*Cerura furcula* (one), *Porthesia similis*, *Hepialus humuli* (one, female), *Plusia gamma*, *P. chrysitis*, *Hydræcia micacea*, *H. paludis*, *Miana literosa* (one, a scarce moth here), *Charæas graminis*, &c.

The 7th was bright and warm. Several larvæ of *Leucania favigolor* had fed up rapidly, and were now full grown, and one spinning up; the remainder were still small, evidently intending to hibernate. It is strange how scarce the Vanessids were this season, notwithstanding the long spell of hot weather, and in the lucerne fields, bright with flowers, I did not see one. There were very few hibernated *urticæ* about in the spring, and no *io*, but I had seen one or two of the latter lately indoors, as if they were looking for some dark corner wherein to hibernate, though it seemed early for that. I had not seen *Pyrameis atalanta* or *P. cardui* yet. *Lycæna icarus* were in great profusion among the lucerne.

The 10th was fine and bright in the forenoon and very hot, with a fresh north-easterly breeze, but became overcast after noon. I went to the woods in the evening for sugaring. Common species were abundant. I took or saw *Acronycta rumicis*, one (? second brood); *Apamea oculatea* and *Triphæna pronuba*, abundant; *T. ianthina*, *Noctua baja*, *N. c-nigrum*, *Amphipyra pyramidea*, many of each; *Catocala nupta*, eight; *Noctua stigmatica*, three; *N. umbrosa*, one; *N. xanthographa*, one; *M. brassicæ*, three (? second brood); *Dipterygia scabriuscula*, one, fresh (? second brood); *Cidaria truncata*, one; and netted *Epione apiciaria*, one female; *Timandra amataria* was still abundant. On the 12th I visited the woods again. Moths were plentiful on the sugar; the same species as on night of 10th, with the addition of a few fresh *G. libatrix*. The weather for the past week was excessively warm. On the 9th the temperature recorded in the shade at Greenwich Observatory was 100°, the highest recorded since the Observatory was started nearly three hundred years ago!

Some ova laid by a female *T. amataria* captured early last month hatched in due course, and a few of the larvæ fed up rapidly, and on the 15th I saw that three of them had spun up on the muslin hood of the breeding-cage, and had changed to pupæ; most of the others were still small.

16th.—About ten days earlier I had caught a female *Chrysophanus phlæas*, and placed her out in the sun in a muslin-covered flower-pot with a growing plant of *Rumex acetosella*; she soon laid a number of eggs on the leaves and stems, and some of these were already hatched on the 16th, and the tiny larvæ had buried themselves in a groove they had eaten in the leaves. It was a very hot day. At dusk I went to the lanes and marshes, sugaring the posts and twigs; moths were abundant, the best being *Cerigo matura*, *T. interjecta*, *H. paludis*, and a second brood of *L. pallens* and *A. exclamationis*, these latter being remarkably small.

The 18th was fine and very hot—82° in the shade. I took a fresh specimen of *Eupithecia pumilata*; this must have been a third brood.

21st.—About a month earlier I had obtained a batch of eggs of *Acidalia dimidiata*, which hatched in a few days. The larvæ fed up rapidly on knotgrass, and the first moth emerged on the 21st. (None of these larvæ showed any disposition to hibernate; the last moth of the brood was bred on Sept. 9th.)

(To be continued.)

NOTES AND OBSERVATIONS.

MALES OF *Bupalus piniaria* ATTRACTED BY A SPIDER.—On the afternoon of June 11th we went into the pine woods to find females of *B. piniaria*, and seeing about twenty or thirty males flying round a head of bracken, we at once expected to find a female, but instead we found the males "assembled" around a spider, belonging to the genus *Theridion* (thanks to Dr. Jordan for name). The spider soon captured a male, secured all its feet in a small web, and bit it under the thorax; I released the moth and removed the stem of bracken with the spider on it away some twenty yards; the males followed and at once surrounded the spider. Thinking a female *B. piniaria* might have been on the same stem, we transferred the spider to a fresh stem of bracken, and again removed it some twenty yards away. In a few seconds all the males had left the old stem and gone to the spider; then, after allowing it to capture one more *Bupalus*, we killed the *Theridion*. Evidently the scent was with the spider, for the male moths dispersed when it was bottled. Has any entomologist made a similar observation? The Hon. Walter Rothschild suggests that the spider had devoured a female *B. piniaria*, the scent of the same remaining. The spider itself was not so large as the moth's body, and it could only have sucked the juices, still the scent might have been retained.—J. J. JOICEY and A. NOAKES; The Hill, Witley, Surrey.

LEPIDOPTERA ATTRACTED BY "HONEY-DEW" ON LARCH-SHOOTS.—Whilst collecting in Northants amongst larches, several *M. stellularum* were noticed about 6 p.m., apparently feeding upon some substance resembling mildew which had affected the shoots of the trees. Whatever the deposit or growth might have been, it appeared to be singularly attractive both to bees and insect life in general. Later in the evening sugar was practically a failure, but an inspection of the larches with a lamp showed them to be swarming with moths. There was nothing sweet in the taste of the affected larch shoots. [The mildew-looking substance mentioned by our correspondent was probably the woolly covering of the larch aphid (*Chermes laricis*, Hartig.).—ED.]—G. B. KERSHAW; West Wickham, Kent.

OVIPOSITION OF *NEMEOBIUS LUCINA*.—On May 30th a female of this species, captured the day before, was placed on a growing plant of *Primula vulgaris*, and although very little sun had been showing, three eggs were deposited on the under side of a leaf some time during the forenoon. Whilst watching the butterfly, about 5 o'clock

in the evening, it was noticed to add two more eggs to the batch, and this, although the sun was totally obscured, and had been for some time. As there had been so little sunshine throughout the day, it is probable that the first three eggs had been deposited under similar circumstances. Up till June 8th sixty-three eggs had been deposited by the one female, and these commenced to hatch on June 12th.—A. T. POSTANS; Portsmouth.

SCARCITY OF *ARCTIA CAIA* IN 1912.—I notice that on p. 187 of the 'Entomologist,' reference is made to the scarcity of *Arctia caia* larvæ this season, and fellow collectors of my acquaintance have also remarked on the same scarcity. In the locality where I usually take larvæ of *A. caia*, however, I have secured over one hundred this season, and these were picked up quite casually along a sunny lane about one hundred yards long. Of *Arctia villica* larvæ, however, I have not seen a single specimen where I usually take them every season.—A. T. POSTANS; Portsmouth.

EUPROCTIS CHRYSORRHŒA IN NORFOLK.—On July 7th last I captured, near Roughton, Norfolk, a female *Euproctis* (*Liparis*) *chrysorrhæa* drying its wings. I thought this was rather an unusual occurrence for Norfolk.—A. C. MORRIS; Leafield, Gibson's Hill, Upper Norwood, July 16th, 1912.

AGROTIS PUTA IN MAY.—Your correspondent, the Rev. C. E. Raven (*antea*, p. 208), may be interested to know that *Agrotis puta* is rather common at our electric lamp. It was first observed this year on May 2nd, rather earlier than in 1911, when it was first seen on the 15th of that month. *Teniocampa gothica* sometimes lingers with us until quite the end of May.—F. G. WHITTLE, 7, Marino Avenue, Southend, July 6th, 1912.

PERCNOPTILOTA (CAMPTOGRAMMA) FLUVIATA IN SURREY.—I should like to record the capture of *C. fluviala* at a lamp in this village on May 13th last. It was in good condition and apparently freshly emerged.—H. FLEET, Junr.; 7, Park Road, Esher, Surrey, June 10th.

DICYCLA OO AND PALIMPSESTIS OCULARIS AT WINCHMORE HILL.—I wish to record the capture of a perfect specimen of *Dicycla oo* at sugar on July 5th about 8.15 p.m. at Winchmore Hill, N. I had only just finished sugaring and took it on almost the last tree I did, and needed no light to see it. I also took a fine specimen of *Palimpsestis ocularis* (*Cymatophora octogesima*) at sugar on June 9th in the same locality, but have not seen either species since, although I have been many times.—L. E. DUNSTER; 44, St. John's Wood Terrace, N.W., July 19th, 1912.

BUTTERFLIES, &c., AT FRESHWATER, ISLE OF WIGHT.—Numbers of *Macroglossa stellatarum* and *Pyrameis cardui* appeared in my garden on June 19th, and continued in diminishing quantity till the end of the month. *P. atalanta* was common at the same time. On July 4th I saw three specimens of *Colias edusa* in and around Freshwater, and heard of others. As early as July 12th the second brood of *Cyaniris argiolus* was on the wing. The first brood was noticed here on April 5th.—S. L. O. YOUNG, M.D.; Brooklands, Freshwater, Isle of Wight, July 19th, 1912.

DEILEPHILA GALII IN SOMERSET.—I have to report the capture of twenty-five larvæ of *D. galii*, feeding on yellow *Galium* on the sand-hills quite close to Burnham, Somerset.—H. DOIDGE; The Bank, High Street, Taunton, July 19th, 1912.

LIMENITIS SIBYLLA AND APATURA IRIS IN SURREY.—On July 9th four specimens of *Limenitis sibylla* were taken in a public wood near here; and on the same date a specimen of *Apatura iris* was captured in a private wood. Another specimen of *A. iris* was found drying its wing on the door of a private garden in this neighbourhood, on July 10th.—J. J. JOICEY; The Hill, Witley.

COLIAS EDUSA IN 1912.—Specimens were noted by members of the S. Lond. Ent. and Nat. Hist. Soc. at Otford on July 27th last. The butterfly has also been seen or captured at other places in Kent, and also in Surrey.—RICHARD SOUTH.

COLIAS EDUSA IN DORSETSHIRE.—It may be of interest to record the capture of *C. edusa* var. *helice* at Purbeck, June 24th.—LEONARD TATCHEL; Bournemouth.

COLIAS EDUSA IN GLAMORGANSHIRE.—I notice in last month's 'Entomologist' (p. 207) that Mr. Rowland-Brown records having seen this butterfly in Bucks, on May 30th. I saw a male *C. edusa* on June 22nd, about 4 p.m., on the roadside near my house at Llandaff. Very few specimens were seen last autumn in this county.—E. U. DAVID; Yscallog, Llandaff.

BUTTERFLY COLLECTING IN SICILY AND CALABRIA IN 1911.—It is pleasant to look forward in the spring to rambles in "sunny" Sicily and Calabria, and especially was this the case after the long dreary winter in England of 1910-11, but occasionally the realization does not come up to expectation. I left London in dull, cloudy weather on April 25th, and on the evening of the 27th arrived at Nervi, a lovely health resort a few miles south of Genoa, where I stopped a night. The town is sheltered from northerly and easterly breezes by hills, and the Pensions have some of the loveliest gardens I have seen, and I found the scent of the orange blossom almost overpowering. The sky was overcast, with occasional slight showers, and during a long walk up a beautiful mountain gorge the only butterfly that ventured out was *ageria* (two specimens). Next day I reached the Junction Station of Roccasecca, between Rome and Naples, at 10 a.m., and hoped for better success, but the clouds hid the sun nearly all day, and only *rapæ*, *cardamines*, *ageria*, and *edusa* were seen or captured, and one larva of *B. quercus* picked up. An amusing episode at the solitary restaurant (a very poor one) and the discovery of a magnificent pass, where the road follows the windings of the River Garigliana (or a tributary) through one of the grandest chasms imaginable, redeemed the day from being unprofitable—I much regretted the absence of sunshine. Next day clouds covered the sky when I reached Gioja Tauro, in Calabria, where I had planned another break in my journey, and instead of stopping I went straight through to Messina.

My first day in Messina (April 30th) proved a glorious day. My son and I took a vehicle as far up the mountain as the road would

permit and revelled in the sunshine. We soon found that the season was very backward, at least three weeks later than the spring of 1910, owing to the relatively very severe winter and continued rains. Guns were popping off in all directions, a sign that the quail was migrating, so we decided to get lunch first, as this is the chief difficulty in Sicily away from the large towns. For this purpose a tin of sardines is a great help, as it forms a first course, and a little butter in which to fry some eggs is essential. With these requisites the contadina or peasant farmer's wife, who was known to us, provided eggs, bread and wine, and we made a meal. Our walk, owing to the quails, was somewhat curtailed, but my note book records:—"Sunny day, lovely gorge, butterflies galore, chiefly *cleopatra* (male and female), *cardamines* (male), *sinapis*, *cyberia*, *megera*, and 'blues,' all fresh."—J. PLATT BARRETT; "Westcroft," South Road, Forest Hill, London, S.E.

(To be continued.)

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 14th.*—Mr. A. E. Tonge, President, in the chair.—Wm. Bateson, Esq., M.A., F.R.S., F.E.S., and Professor E. B. Poulton, D.Sc., M.A., F.R.S., were elected honorary members.—Mr. Andrews exhibited three species of Syrphidæ, parasitic in their larval stage upon Lepidoptera, viz., *Catabomba pyrastri*, *Xanthandrus conitus*, and *Melinostoma mellinum*.—Mr. Adkin, an extreme melanic specimen of *Noctua xanthographa*, taken in his garden at Lewisham in 1911.—Mr. Newman, living full-fed larvæ of *Melitæa aurinia* fed up in temperature of 60° to 70°, and a pair of *Saturnia carpini* with all the usual reddish markings of a clear yellow. It was bred from a yellow male and a red female.—Mr. Blenkarn, the Coleopteron *Halypus nomacæ*, from Coatbridge, recently new to science.—Mr. B. H. Smith, a living larva of *Colias edusa*, from ova laid in October last; one larva had already pupated.

April 11th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Step exhibited the crustacean *Squilla demarestii*, and described its Mantis-like appearance and habits.—Mr. Gibbs, long series and specimens of *Pieris napi* from various British localities, and pointed out their racial characters with reference to various continental races and forms.—Mr. Cowham, hybrid *Nyssia zonaria* and *Biston hirtaria*, varied series of *Hybernia leucophaea* and *H. marginaria*, small forms of *Leucania pallens*, probably of the second brood, and bred specimens of *Zonosoma pendularia* from Oxshott, referable to the rosy form var. *subroseata*.—Mrs. Hemming, bred series of *Melitæa aurinia*: the Carlisle series included a melanic form and var. *virgata*, the Welsh series included forms with very red ground colour, and the Oxford series contained very pale specimens as well as a specimen closely resembling *M. cinxia*.—Mr. Quarrington, living larvæ of *Rumicia phlæas* taken wild on April 7th and 10th.—Mr. Newman, full-fed larvæ of *Abraxas grossulariata* kept in sleeves out-doors, and living pupæ of *Dryas paphia* and *M. athalia*.—

Dr. Chapman, living larvæ of *Leioptilus tephradactyla*.—Mr. Tonge, a branch of *Viburnum* from Tilgate, with four larvæ of *Ægeria andrenæformis*.—Mr. Colthrup noted the abundance of *Biston hirtaria* this season, especially around London.—Mr. R. Adkin, many examples of named varieties of British Lepidoptera to illustrate his paper entitled "Varietal Names as Applied to British Lepidoptera."

April 25th.—Mr. B. H. Smith, B.Sc., Vice-President, in the chair.—Mr. Dennis exhibited a stereoscope, fitted up so as to show diminution and intensification of the stereoscopic effect.—Mr. H. Moore, Lepidoptera from N. Borneo, including *Papilio paradoxus* var. *tileicles*, *Hestia hypermnestra* and var. *belma*, *Hestia lynceus*, a large species of *Nyctalemon*, &c.—Mr. Edwards, several species of the genus *Charaxes* from Central and South America, and a *Cucullia verbasci* which had been two years in pupa.—Mr. Lucas reported that from April 4th to April 23rd, in the New Forest, he had noted fifty-seven species of plants in flower, and that *Boarmia cinctaria* was out on April 5th. The rest of the evening was given up to the exhibition of lantern slides by Messrs. Dennis, Lucas, and Edwards, the last-named showing slides illustrative of the anomalous animal the *Peripatus*.—HY. J. TURNER, *Hon. Report. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—February 18th, 1912.—Meeting held in the Royal Institution, Colquitt Street, Liverpool.—Dr. P. F. Tinne in the chair.—Mr. William Mansbridge contributed notes on "Breeding Experiments with the Black Race of *Boarmia repandata* (var. *nigra*)," and summarized the results as follows:—In 1909 (a) a wild female of the local type form gave all var. *nigra*, (b) a wild female var. *nigra* gave all black moths; (c) a pairing of *nigra* male and type female gave all types. In 1910 (a) type \times type gave 66.6 per cent. type and 33.3 per cent. var. *nigra*; (b) *nigra* \times *nigra* gave 92 per cent. *nigra* and 8 per cent. type; and (c) *nigra* \times *nigra* gave 96 per cent. *nigra* and 4 per cent. type; while in 1911 (a) type \times type gave all type; (b) *nigra* male \times type female gave all *nigra*; (c) *nigra* \times *nigra* gave 95.7 per cent. *nigra* and 4.3 per cent. type, and (d) a second experiment of the same gave 70.5 per cent. *nigra* and 29.5 per cent. type. In 1910 moths from the broods a and c were used for the cross pairings of type and variety, the others being inbred; and in 1911 all were inbred. Dr. Tinne exhibited *Lycæna icarus* from North Ireland, including very blue females.—WM. MANSBRIDGE, OSCAR WHITTAKER, *Hon. Secretaries.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—February 7th.—Mr. J. Mangan, M.A., gave a lecture on "The Larch Sawfly (*Nematus erichsonii*) and its Parasites." After dealing with its life-history, habits, and destructive powers, he detailed the various natural checks found to affect this insect:—(1) Parasites. *Mesolenus aulicus* has been found (in the Lake District) in the greatest numbers, and is apparently the most valuable natural check. *Microcryptus labralis* also occurs; examples of each were shown. (2) A fungus attacks the sawfly cocoons. (3) The field-vole (*M. agrestis*) occasionally destroys as many as thirty or forty per cent. (4) Birds, such as chaffinches, tits, and starlings, are useful.—Mr.

B. H. Crabtree read a paper:—"Some Butterflies of the Rhône Valley." During July, 1912, he visited Chamonix, Zermatt, and Berisal, and took between fifty and sixty species, specimens of most of which were exhibited. The species of the genera *Lycæna*, *Colias*, *Parnassius*, *Erebia*, &c., were particularly noteworthy.—Mr. J. H. Watson exhibited *Ornithoptera priamus* (male and female) and *O. paradisea*, and an example of *O. d'urvilleana*. He also showed *Papilio laglaizei* and a moth which mimics it in a most remarkable manner—*Alcides agathyrsus*.—Mr. W. Mansbridge showed *Tortrix costana* with var. *laticornis*, from the Liverpool district, and var. nov. *liverana*, taken by himself at Liverpool, and by Mr. A. E. Wright at Burnley. He showed also *Amphidasys betularia*, from Simonswood, Lancashire, an intermediate form between the type and var. *double-dayana*.—Mr. R. Tait, Jr., recorded the capture, by Mr. W. A. Tyerman, of *Dasypolia templei*, in Oldham Road, Manchester, on February 5th, 1912.—A. W. BOYD, M.A., *Hon. Secretary*.

RECENT LITERATURE.

Forty-second Annual Report of the Entomological Society of Ontario, 1911. (Published by Ontario Department of Agriculture, 1912.)

THIS report, consisting of one hundred and fourteen pages with a number of illustrations, relates chiefly to useful and injurious insects. One or two short papers are of a more general nature, including one on "Insect Migration at Aweme, Manitoba." A discussion on the "Catalogue of Canadian Insects," to be at once undertaken, will be found of interest.

W. J. L.

*The Early Stages of our Dragonflies.** By W. J. LUCAS, B.A., F.E.S.

WE have now received a print of the very interesting address which Mr. Lucas presented to the Lancashire and Cheshire Entomological Society at their last Annual Meeting. A brief summary of the address was embodied in the account of that meeting which appeared in the 'Entomologist' for February last, but we find that Mr. Lucas was there wrongly reported to have drawn "particular attention to the habit *Ischnura elegans* possesses of descending beneath the surface of the water" for the purpose of oviposition. The species really referred to was, of course, *Enallagma cyathigerum*, and on one or two occasions we have ourselves witnessed the same insect engaged in subaqueous oviposition.

Mr. Lucas traces in some detail the progress of our knowledge of dragonfly nymphs, but he seems to regard Moufet's 'Insectorum Theatrum' (1634) as containing the earliest reference to them. According to some other bibliographies which we have seen, however, the literature of the subject begins with the writings of Rondelet (1555) and Aldrovand (1618). At the present time, Mr. Lucas says, "leaving out *Sympetrum vulgatum*, *S. fonscolombii*, and

* Thirty-fifth Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society. Session 1911.

S. flaveolum, the only species of which descriptions appear to be wanting are *Sympetrum sanguineum*, *Libellula fulva*, *Somatochlora arctica*, *Æschna cærulea*, *Lestes dryas*, *Agrion armatum*, and *A. hastulatum*." As a matter of fact, some of these nymphs are well known already. For instance, *Sympetrum sanguineum* and *Libellula fulva* have been fully described by Dr. E. Rousseau, the first in Ann. Soc. Ent. Belg. lii. p. 290 (1908), and the second in Ann. Biol. Lacustre, iii. p. 337 (1909); Dr. F. Ris described the nymph of *Somatochlora arctica* in Mitt. Schweiz. Ent. Ges. xii. p. 33 (1911). Apart from Hagen, a short diagnosis of *Lestes nympha* (= *L. dryas*) may be found in Tumpel, Geradfl. Mitteleuropas, p. 72 (1901). Reference may also be made to the tables of nymphs given by Ris (in Brauer, Susswf. Deutschl. Odon. (1909)), in which are characterized the nymphs of several species occurring in our own country.

British Odonatists are much indebted to Mr. Lucas for the beautiful figures of dragonfly nymphs which he has published already, and we learn with satisfaction that he has before him the nymphskins of sixteen additional species, from many of which he hopes to make drawings.

H. C.

OBITUARY.

EDWARD ARTHUR FITCH.

Edward Arthur Fitch died at the Brick House at Maldon, after an operation for acute gastritis and other complications, early on June 28th last. He was a J.P. and C.A. for Essex, and had several times been Mayor of his town, besides filling many other civil offices. In general, it is said, "Mr. Fitch was remarkable inasmuch as, while taking an active part in local and public affairs, he yet found time to devote attention to archaeological and literary matters, and display an interest in sport, while all the time he was carrying on business as a farmer." As an entomologist he was one of our great disappointments. An education at Great Ealing School and King's College, London, did little more than harness natural brilliancy and that quick perception of fundamental points in an intricate subject, so well exhibited in his generic articles concerning our parasitic Hymenoptera, upon which he wrote the text and Bridgman the tables of species in their incomplete "Introductory Papers on Ichneumonidae," published in our Magazine from February, 1880, to August, 1885. This is the work by which he will be remembered among us; though his "Descriptions of Oak-galls," translated from Mayr's 'Die Mitteleuropaischen Eichengallen' by Mrs. Hubert Herkomer and himself, together with many shorter articles from his pen upon a wide range of kindred subjects, also appeared in the same Magazine, of which he became an Assistant Editor in 1877. He joined the Entomological Society of London when only twenty years of age, served it as Hon. Sec. in 1881-5, and as Councillor in 1879 and 1886, about which time he threw up Entomology finally and entirely. We have corresponded with him from time to time, and ever found him most courteous and willing to lend rare tracts on the Palæarctic Parasitic Hymenoptera, upon the literature of which he possessed

something very like a complete collection in 1890. As a general naturalist he was known as Chairman of the Essex and Kent Sea Fisheries, a Fellow of the Linnean Society, of the Essex Archaeological Society and Field Club, of which last he was President for ten years. He was the only son of Mr. Edward Fitch, of London, and was born on February 23rd, 1854. He married a daughter of the late Mr. Isaac Belsham, of Rayleigh, and leaves five sons and four daughters.—C. M.

ROBERT SHELFORD, M.A., F.E.S.

THE tragic and premature death of Robert Shelford has removed a most active and competent entomologist in the prime of his career, before the completion of his work.

He was born on August 3rd, 1872, at Singapore, and so was within a few weeks of completing his fortieth year.

Educated at first privately, and then at King's College, London, he proceeded to Emmanuel College, Cambridge, where he passed second in Science. His first appointment was at Leeds, as Teacher in Physiology, but this he soon gave up in favour of an offer more tempting to a man of his temperament, the Curatorship of the Museum at Kuching, Sarawak, under Rajah Brooke. After serving here seven years he returned to England to take up an appointment in the Hope Department of the University Museum of Zoology at Oxford, where he devoted himself with enthusiasm to the task of arranging the rich collection of Orthoptera, with the result that before long he found himself involved in the entire reorganization of the Blattidæ; he rapidly acquired an unrivalled knowledge of this group, examined a very large number of types from most of the museums in the world, and published a valuable and important series of papers, in various periodicals, dealing with his speciality. Had he been spared a few more years, he would have doubtless given us an entire monograph of the recent cockroaches.

His general scientific education, and his seven years in the gorgeous tropics of Sarawak, gave him a breadth of outlook upon scientific problems which he expressed in terse and crisp language. In addition to his special work he published articles on Bornean Anthropology and Folk-lore, and upon Mimicry in Bornean Insects, and he whiled away some of the tedium of his last years, spent in almost constant suffering, by writing a book upon his observations of tropical nature in Sarawak. He left the MS. unfinished, but it is to be hoped that part at least will yet see the light.

About three years ago, the complaint which had already severely handicapped him assumed an aggravated form, and under medical advice he moved to Margate, where he lingered on, reclining constantly on his back, obliged to abandon all hope of future activity. He bore the cruel disappointment with great fortitude, till his sufferings, becoming more and more acute and practically incessant, drove him to desperation.

Thus Entomology has lost a devoted servant, who had already achieved distinction, and cut off in the prime a most promising scientific career.—M. B.



PUSZTA-PISZÉR. A TYPICAL "BÜCZKE"



PUSZTA-PISZÉR. A TYPICAL FLAT OPEN SPACE.

THE ENTOMOLOGIST

VOL. XLV.]

SEPTEMBER, 1912.

[No. 592

SOME NOTES ON THE LIFE-HISTORY OF *MELAN- ARGIA JAPYGIA* SUBSP. *SUWAROVIVUS*.

By F. W. FROHAWK, M.B.O.U., F.E.S., AND THE HON. N. CHARLES
ROTHSCHILD, M.A., F.L.S., F.E.S.

(PLATE VII.)

THIS Eastern race of *M. japygia* extends as far westward as Pusztá Peszér in Hungary. This is apparently the only locality in that country where the species is at present found, though, according to Aigner,* at one period it occurred close to Budapest. Aigner* further maintained that the Hungarian specimens could be distinguished from those coming from the Ural Mountains and South Russia, and formed a special local race, *clotho* IIb. This distinction, however, cannot be maintained, and the most that can be said is that the Peszér examples are very large and very white: they are, in fact, remarkably fine specimens, a feature exhibited by most of the butterflies occurring in this classic locality. Several entomologists have described Peszér, but only one appears to have seen this remarkable butterfly in any abundance, *i. e.*, Miss Margaret E. Fountaine,† and none have, as far as we are aware, described the peculiar features of the wood. Pusztá Peszér is a long narrow wood of some 1300 acres of by no means a uniform character. The northern third has been artificially afforested some eighty years ago, and consists largely of acacia (*Robinia pseudacacia*) and poplar trees, planted on sandhills which at the time of afforestation were wind-blown and shifting. The middle third of the wood consists (or perhaps one should say consisted) largely of oak trees, sparsely scattered with numerous open spaces between them, the soil being a mixture of sand and humus, or, as it is locally known, "black sand." The most southern portion of the wood resembles the middle portion as to general contour and quality of the soil, but lacks, to a great extent, the oak which is here replaced by birch. It is in the two last-named portions of the wood (the true forest) where *suwarovivus* is found, and both these

* Rev. Lap. xiv., p. 144 (1907).

† Ent. xxxi., p. 286 (1898).

portions possess a common geological feature, namely, that of "Buczkas" or sandhills (see Plate VII). The whole surface of the ground is covered with mounds of soil (a mixture of sand and humus) shaped like an inverted saucer, *i. e.*, rounded at the top (which is nearly pure sand) and gradually sloping away to a wide flat base of the above-mentioned "black sand." The effect of this formation is that the surface of the land really consists of a number of mounds with more or less flat spaces between them, the mounds being more sandy than the plains between. The rain water falling on the mounds rapidly runs down from them, but remains on the flat land between, and produces a curious effect on the general vegetation of the locality. The mounds possess but few plants, those present binding together the sand, but the flatter spaces between (see Plate VII.) being richly watered are covered with numerous flowers and plants; in fact, in some cases where the land is especially low-lying, the ground is positively swampy and supports reeds. The imagines of this butterfly flutter about over these sandhills, where they deposit their eggs during June, and the species would appear to be normally full out about the middle of the month. The insects, however, generally frequent the flowers growing on the flatter portions, where they obtain sustenance. Miss Charlotte de Wertheimstein informs us that she has absolutely observed a female deposit an egg on a plant of *Festuca sulcata*. Owing to the fact that some of the grasses grow so very close together, it is a matter of extreme difficulty to decide from which of several grass plants the larvæ taken at night with a lantern really come. The adult larvæ which are described in this paper were undoubtedly taken from a plant of *Festuca sulcata* growing in the "Buczkas," *i. e.*, the raised sandhills, and this *Festuca*, with its variety *rupicola*, we have no hesitation in stating is the food-plant, at all events here, of the larva of this butterfly. The other species of grass growing in close proximity (and there are several) can now be rejected as possible food-plants with absolute certainty.

In June, 1910, we placed a much worn female of this species on a pot of grass, and about thirty ova were laid and dropped loosely on the surface of the soil. These ova hatched on July 19th, and in February, 1911, we found that two had recently fed on fescue grass (*Festuca ovina*). They had grown slightly, and had become greener in colour, but they died shortly after. As we shall show later on in this paper, it is quite abnormal for the eggs of this species to be dropped in the grass.* A similar experiment

* This phenomenon has been observed in the eggs of other lepidopterous insects when they are in a worn and emaciated condition, for example, in the eggs of *Sphinx ligustri*, both the authors and Mr. L. W. Newman having possessed worn females of this moth which deposited eggs entirely lacking the usual gummy substance by which they are normally fixed to the leaves of the food-plant.

was carried out in 1911, and eggs were obtained all glued to the gauze, or the wires supporting the gauze, or the grass. On June 10th this year some females were placed on different species of grass plants potted up, each with a gauze-covering supported with wires. The butterflies at once began depositing, they lived for three weeks in captivity, the last one surviving until July 5th; they all deposited a number of eggs. All the eggs were laid either on the grass blades, gauze-coverings, or the wires, but by far the greater number were laid on the gauze, often in rows or clusters between any folds they could find for the purpose, or between the wire and gauze when the eggs were usually deposited on the wire. A large number of eggs were laid while the females were under observation, so that the exact method of depositing could be accurately recorded. Unlike *M. galathea* which deposits its eggs at random, letting them fall among the grass, without laying them on any object, *suwarovivus* always attaches its egg in a manner similar to that of other Satyridæ.

The egg is $\frac{3}{4}$ in. high, of an ovate-spheroid shape, broadest below the middle; the micropyle is finely pitted, the entire surface finely granular; the apical third and basal third irregularly and roughly reticulated, forming ridges and coarse granulations which develop into short striations longitudinally, the central third is strongly and boldly fluted with from ten to thirteen longitudinal keels—of ten eggs counted. Two had ten, two twelve, one thirteen, and five eleven. The concave intervening spaces are finely ribbed transversely, and at each end of the concavities are very short ribs between the main keels.

The colour when first laid is greenish white, which gradually becomes whiter, and finally it is white with pale citrine-yellow shadows, giving the egg a very pale lemon-yellow tinge. From the density of the shell it remains unchanged in colour until hatched, when the empty shell is pure white.

The egg state lasts about twenty-three days. The eggs deposited in 1911 started hatching during the first week of July.

The young larva eats away the whole of the crown of the egg, emerges, and rests close to the empty shell, remaining motionless without feeding throughout the autumn and early winter. All those in our possession during 1911–1912 died during hibernation; the last one survived until the middle of March, 1912, living eight months without moving after it first emerged from the egg. The continued damp weather of last winter obviously was the cause of failure, as all were attacked by mould.

The larva directly after emergence measures $\frac{1}{10}$ in. long, the head is large creamy-ochreous in colour, the surface roughly granular, and beset with white hairs rising from tubular bases; eye spots and mouth parts brown; the body tapers to the anal

segment which bears two terminal points each ending in a fine straight hair; the segments are somewhat indistinctly subdivided, the first division occupies the anterior half of the segment, on which are placed (on each side) four long curved glassy white hairs with tubular bases; the first is sub-dorsal, the second super-spiracular, and the third and fourth sub-spiracular on the large lateral lobe; all curve backwards except the super-spiracular one, which curves forwards; on the posterior half is a second sub-dorsal hair, acutely elbowed where it is widened out, then running at right angles and sharply pointed; other hairs exist on the ventral surface and claspers. All the hairs are pure white and glassy. There is a fine medio-dorsal longitudinal line, a finer and less distinct sub-dorsal line, and a rather plainer spiracular line; between these two lines is a rather broad band; this as well as the lines are dull red-brown; the spiracles are dark brown. The whole surface of the body is granular and of a pale creamy-ochreous colour.

On May 17th, 1912, we received from Hungary two larvæ, one almost fully grown, the other rather smaller; from their great similarity to the larva of *galathea*, we at once felt certain that they were *suwarovius*, which is now proved to be the case by the emergence of the perfect insect. The larva when fully grown is $1\frac{5}{16}$ in. long. Excepting its larger size and the formation of the head it is exactly like *galathea* in form, and in colour it greatly resembles the green variety of the latter. The chief difference is the head of *suwarovius*, which is wholly green and unicolorous with the body, and bears two flattened projecting points with the front edge serrated. The head of *galathea* is globular, without the points, and always ochreous-yellow both in the green and ochreous forms. *Suwarovius* has deep orange spiracles which in *galathea* are black.

The ground colour of *suwarovius* is green, with a dark green medio-dorsal longitudinal stripe bordered on either side by a pale yellow-green line; a greenish white subdorsal stripe bordered below by dull green; spiracles deep orange; legs pale buff; anal points purple at base, fading into rose pink at tips and laterally striped with pearl white. The entire surface, including the head, is clothed with white sharply-pointed bristles.

On May 26th the largest larva ceased feeding and roamed about for several hours, and the following day entered the basal grass stems and spun a loose network of silk on the surface of the earth and stems, forming a slight oval-shaped cocoon, in which it remained concealed almost hidden from view for a week, and pupated on June 3rd. The following day it was figured as it was, but in order to show the cocoon more clearly some of the grass (*Festuca*) was removed from the front; after figuring it, the top of the cocoon was opened up for examination of the pupa, when it was then of a translucent pale ochreous-

green over the head, thorax, and wings, inclining to glaucous on the anterior portion; and the abdomen pale amber. The colouring very gradually became duller and uniformly more ochreous-olive over the head, thorax, and wings, and the abdomen browner. By the fourteenth day the central area of the wing assumes a pale buffish tint, the base and hind margin remaining greenish, and a few indistinct smoky-brown spots appear between the nervures; by very slow degrees the green colouring disappears and the wings become opaque-ochreous, and very gradually the head and limbs acquire a dusky hue, and the abdomen deepens slightly. On July 6th the colouring of imago began to appear, on the following day it rapidly matured, the wings then showing ochreous-yellow marked with dark brown, the rest of the pupa being dull brown, and on July 8th a fine female butterfly emerged. The pupal stage lasted for thirty-five days.

The pupa measures $\frac{7}{10}$ in. long. It closely resembles that of *galathea*, but is considerably larger, being $\frac{1}{4}$ in. longer, having the abdomen more elongated, with a dorsal depression between the second and third segments, and the cremaster is more decurved, which in *galathea* is almost straight; the ventral outline of *suvarorius* is straight from the apex of the wings to the cremaster, otherwise the form is very similar to *galathea*. The cremastral process terminates with a bunch of amber-coloured spines, some almost straight, others having the apices slightly curved. The abdomen is clothed with minute dart-shaped spines and the entire surface is granular. The thoracic spiracle, like *galathea*, forms a conspicuous black projecting ear-shaped process, giving the head a peculiar appearance. The wings are finely transversely reticulated and the whole structural detail is finely outlined with brown.

The authors take this opportunity of expressing their most sincere thanks to Mr. Theodor Micklitz, the Director of the Austrian Emperor's Forests, for his great kindness in granting permission to visit Pusztá Peszér, without which this present article could not have been written.

THERA VARIATA IN BRITAIN.

By LOUIS B. PROUT, F.E.S.

PROBABLY the above heading will cause surprise to a good many readers, and some may wonder whether my next discovery will be *Campptogramma bilineata* in Britain! It seems to have been forgotten by, or to have remained unknown to, the majority of present-day British lepidopterists, although it was well known to the illustrious Doubleday, that the *Thera* which

occurs so generally and so abundantly in our pine-woods is not the true *variata*, Schiff., but an allied form (whether species, subspecies, or fixed variety is not yet positively determined) appearing in Staudinger's 'Catalog' as "v. (et ab.) *obeliscata*, Hb." In the 'Entomologist,' vol. iii. p. 84, Doubleday wrote: "*Thera obeliscata* of Hübner.—I send you two larvæ of our *Thera*, which I think is really distinct from the *variata* of Hübner,* although I believe all modern entomologists are of the contrary opinion: Dr. Staudinger has sent me what he considers intermediate varieties, but they do not seem so to me: the true *variata* is of an olive or greenish brown, with a strongly dentated central fascia; ours is always either of a rufous or blackish tint, and the central fascia is scarcely at all dentated." Newman, in describing the larva (*tom. cit.*, p. 83), assents to Doubleday's opinion, and in 'British Moths' (p. 151) follows the same course, maintaining the name of *obeliscata*.

Staudinger (Stett. Ent. Zeit. xxii. 389, 1861) only tells us that he sinks *obeliscata* as var. to *variata* because the identity "is said to be experimentally proved" and has been "confirmed to him by his friend Wocke"; a highly unsatisfactory note, for which I can find no experimental basis, and doubly unsatisfactory because Staudinger in the self-same place speaks of the two as "so different in appearance," and records *only* the *obeliscata* form for Bossekop. On the other side we have (apart from the *ipse dixit* of Treitschke) to consider the following observations. Ratzeburg ('Waldverderbniss,' ii. 407, 1868) says that several recent observers, as Herrn Tieffenbach and Werneburg (*in litt.*), agree that the *obeliscata* form lives on Scotch fir, the *variata* form on spruce. Rössler (J. B. Nass. Ver. Nat. xxxiii.—xxxiv. 154) has the same experience (*variata* on *Pinus abies*, *obeliscata* on *Pinus sylvestris*), and a like observation is quoted by Kolbe (Einführung Kenntn. Ins. p. 67), but probably at second- (or third-) hand, as he attributes it to "Staudinger." Klemensiewicz (Verh. z.-b. Ges. Wien, xlv. 188) confirms Rössler with the statement that in Brody, where the woods are exclusively of *Pinus sylvestris*, he has always found only *obeliscata*, whereas his general experience with regard to Galicia is that *variata* is much the commoner and more widely distributed. Again, Franz Schmidt (Arch. Ver. Fr. Nat. Mecklenburg, xxxiii. 186, 1879) questions whether Staudinger has done right in uniting them, and records that *obeliscata* is very common in all his pine-woods twice in the year, but that *variata* is scarce and local, and has never occurred among *obeliscata*. And in 1888 A. Hoffmann (Stett. Ent. Zeit. xlix. 172) reports *variata* as occurring in the Upper Hartz Mountains in great numbers from the end of June to the end of August, apparently in a continuous succession, very

* *Variata* [Schiff.] Schmett. Wien. p. 110; Hb. fig. 293; Tr. vi (1), p. 334 (*nec* Haworth).—L. B. P.

variable, but always belonging to "typical *variata*," the larva on *Pinus picea*. Recently the question has again been somewhat to the fore, e.g., Laplace (Mitt. Ent. Ver. Hamburg-Altona, 1899-1904, p. 100) records *variata* "everywhere in spruce-woods, probably two broods, middle of May to end of July, larva May and June on spruce; *obeliscata* everywhere in pine-(Kiefern-) woods, irregular, but certainly double-brooded, end of May to October, larva May and July-August on pine (Scotch fir)." Blocker (Rev. Russ. Ent. viii. 48) writes in a similar strain, that *obeliscata* is "unconditionally an independent species. Besides the extraordinarily sharp distinction in design and ornamentation, the two forms are distinguished in manner of life: *variata* lives on spruce, but *obeliscata* on pine, and appears a little later than *variata*. In pine-woods only *obeliscata* is taken; in spruce-woods only *variata*. Where both spruce and pine grow together, both species occur together, but evidently they do not mix, as intermediate forms are not met with."



♀

Thera variata.

♂

The above survey, which of course does not profess to be exhaustive, will show that we have been much too "previous" in merging the whole heterogeneity under the single name of *variata*, and have now to submit to a third edition of the inconvenience to which we were subjected nineteen years ago, when the late C. G. Barrett announced the "true *Acidalia osseata*" in Britain, and again, four years ago, when Messrs. Sharp and Wightman introduced us to "*Nonagria neurica* in Britain." When will entomologists learn the importance of maintaining a separate name for a separate concept? Whether *obeliscata* be or be not a "species," it is an entity which we ought never to have allowed ourselves to call "*variata*"; if we were very anxious to bolster up the Staudingerian theory, it would, of course, have been permissible, though rather cumbersome, to call our insect "*variata obeliscata*."

For myself, I have always felt convinced that the two were species, and I submitted the genitalia to Mr. Pierce several years ago; but as these unfortunately yielded nothing tangible, I published nothing on the subject, unless possibly there be a stray note in the Trans. City Lond. Ent. Soc., in connection

with an exhibit. At any rate, it was with no small degree of pleasure that I received from my friend Major Robertson, in December last, six bred specimens of the true *variata*, which emerged in May, 1911, from larvæ taken on small ornamental spruce in his own neighbourhood (Chandlers Ford). They had struck him as a peculiar form, quite different from anything which he had seen before, nor were they familiar to any of his friends who had seen them; but not being acquainted with the particulars which I have set forth above, he was naturally unprepared for my identification. I promised him at the time that I would publish a note on the discovery, but asked leave to postpone it for a little, expecting shortly to be working at the genus in preparation for Seitz's 'Macro-Lepidoptera of the World.'

In the meantime Major Robertson has been successful in breeding it again, so that it is evidently now established, however it may have been introduced. He has recently presented to the British Museum a very nice series (mostly males, but including two females) bred in the middle of May; these I have had the pleasure of examining. They vary moderately, but never in such wise that they could be mistaken for *obeliscata*. Indeed, I may mention, as illustrating to those readers who have not yet seen them the wideness of the divergence, that Mr. J. Hartley Durrant (in the neighbourhood of whose Thetford home *obeliscata* used absolutely to swarm) did not at all recognize them, and assured me he had never seen a specimen approaching them. The width and strength of the median band varies a good deal, the tone of colour slightly, some being greyer, some browner; but none approach the red-brown of *obeliscata*, nor the melanism of its ab. *obliterata*. The interesting ab. *stragulata* Hb. (= *vitiosata*, Frr. = *resinaria*, Peyer.) has not yet occurred among Major Robertson's forms.

In addition to the colour difference, which alone is used in Staudinger's 'Catalog' (*variata* = "forma grisescens," *obeliscata* = "forma brunnea vel fulva"), and the jagged median band mentioned by Doubleday (see above)—both good characters—true *variata* can nearly always be differentiated at a glance by its better-marked and strongly dentate subterminal line (often very clear and pale) and better-marked hind wing, nearly always with a distinct central spot and not rarely with a fairly definite post-median line. It is only in a few very weakly marked specimens that these characters can become obliterated; I believe that wherever the course of the pale postmedian line of the fore wing can be seen at all in either species, it will be found absolutely reliable.

It will be interesting to see, now that Major Robertson's discovery has called attention to the matter, to what extent *variata* really is established in Britain, and how far it maintains the

distinctions of habitat and food-plant claimed for it on the Continent. In our early literature, the only hint with which I am acquainted is a note by Sir Thomas Moncreiffe in 'The Scottish Naturalist,' vol. iv., p. 241: "We have a dark and a pale variety here, which Mr. Herd believes to be different insects. He tells me the larvæ are quite distinct, and that from one form he always breeds the dark insect, and from the other the paler." But as darkness and paleness are not the obvious distinctions of the two species before us, and no mention is made of different food-plants (the record is simply "common among Scots fir"), not much use can be made of the note. I am, however, able to add to Major Robertson's two other records. Dr. E. A. Cockayne has detected in his collection a single female of *T. variata* which he took on June 10th, 1901, on a spruce in a wood of oak and spruce in Berkshire. He spent an hour in the same locality this year without seeing either *variata* or *obeliscata*. The Rev. C. E. Raven, of Cambridge, has had a very interesting experience. The week after Easter he was beating spruce in the New Forest for larvæ of *Boarmia ribeata* (*abietaria*), and beat among them a large number of what he assumed to be *obeliscata*; of these he kept some twenty-five to thirty to renew his series. They commenced to emerge by the end of April, the first being a beautiful female aberration of *variata*, bronze-coloured, with no bar, and of a very marbled appearance, and washed with green in certain lights. Then came a typical grey female *variata*, but after this, with the exception of one male *variata* and one female which Mr. Raven regards as "as nearly as possible intermediate," all (some fifteen) were typical *obeliscata*. Mr. Raven has kindly invited me to study his material closely, as soon as an opportunity offers, and in the unlikely event of my judgment differing from his, I will report to readers of the 'Entomologist' later. Neither he nor Major Robertson has as yet detected any distinction in the larvæ, but the latter has kindly promised to send me some, in the hope that I may be more fortunate.

With the exception of Mr. Raven's, I have no record of *obeliscata* feeding on spruce. The testimony, both British and foreign, is unanimous to the fact that its natural food-plant is Scotch fir, and as this is our only indigenous British pine, the dominance of *obeliscata* in this country is not surprising; but there must have been hundreds of opportunities, ancient and modern, for the introduction of *variata* (which has never yet been recorded on *Pinus sylvestris*) with other species of pine (*sens. lat.*), and it is quite possible—though I have hazarded a *conjecture* of recent importation—that it has been sedentary among us for a very long period. The question of food-plant, moreover, though important, must not be over-pressed, as neither species is absolutely monophagous. Spormann (Progr. Gymn. Stral-

sund, 1909, p. 8) tells us that Prof. Stange, who "rightly holds *variata* and *obeliscata* to be different species, found larvæ of the latter on *Juniperus* and *Larix*, as well as on pine"; while *Pinus picea* would appear to be shared as an occasional substitute food-plant by both species (cf. Hoffmann, Stett. Ent. Zeit. xlix. 172 for *variata*; Barrett, Lep. Brit. Isl. viii. 356 for *obeliscata*—"rarely").

Postscript.—Since writing the above I learn that Major Robertson has also found the larvæ of *T. variata* on two other conifers, the Silver Fir (*Abies pectinata*) and the Norway Spruce (*Picea excelsa*). In a letter dated August 28th, he writes, "I have four or five pupæ of *T. variata*, 2nd brood, and other larvæ sleeved out seem to be feeding up rapidly."

"WHERE WALLACE TROD": BEING SOME ACCOUNT OF AN ENTOMOLOGICAL TRIP TO MT. SERAMBU, SARAWAK, BORNEO.

BY J. C. MOULTON, B.Sc., F.L.S., F.Z.S., F.E.S.,
Curator of the Sarawak Museum.

(PLATES V. & VI.)

(Concluded from p. 217.)

THE fortnight on the mountain went by all too quickly, as most entomological expeditions only too often do. If fine and a promising day generally, we would climb to the top and wait on a small cleared spot up there for insects to visit us, but generally clouds and rain developed, preventing any big captures there, although such spots are generally most productive in Sarawak. The clearing round our hut produced most insects, but we also tried the lower slopes of the mountain with varying success. At night time we were kept busy by the improvised light-trap, which we were told afterwards was easily visible from Bau, some four miles down the valley to the south-west of us; the light in our hut also attracted many moths. Sugar was tried, but without success. In our day at the birds'-nest caves on Mt. Jibong we were astonished at the numbers of cockroaches swarming on the sides of the caves and in the soft guano which filled the floor. These proved to be two species—*Ischnoptera cavernicola*, Shelford, and *Periplaneta australasie*, Fab. The place seemed alive with them, and, together with hundreds of screeching swifts, whirring bats, and the twinkling lights of the Dayaks, whom we could just discern high up in the roof above us, clinging to a frail bamboo scaffolding while they took the nests which are so highly prized by the Chinese epicure, formed an interesting scene not easily forgotten.

On Serambu we prepared heaps of rotten fruit, which attracted a certain amount of small insects.

The small clearing made round our hut used to be quite gay with butterflies whenever the sun was shining brightly, and I longed to see an attractive row of flowers planted, so as to bring these beautiful creatures within easier reach of the net. As may be imagined, a chase in the jungle after any coveted species can only be of the shortest, as the undergrowth and uncertainties of the ground, once you leave a path, occupy all one's attention. Among the butterflies caught or noticed were the following:—

NYMPHALIDÆ.—Danaini: the big, lazy-flying *Igestia lynceus*, Drury, *Ideopsis daos*, Boisd., and *Danaïs aspasia*, Fab. Euplœini: *Euplœa claudius mulciber*, Cr., common. Satyrinæ: species of *Mycalesis*, *Ypthima* and *Erites*; a large *Melanitis*, apparently nearest to *zitenius*, Herbst., which may be distinguished from the only other Bornean *Melanitis* (*M. ismene*, Cr.), so common in Sarawak, by the presence of an orange apical band on fore wing instead of the eye-spot below the apex of fore wing; in the Serambu specimen there is a faint orange apical band. Elymniinæ: *Elymnias nigrescens*, Butl., was very common in sunny clearings on the hillside; one *E. lais*, Cr., was taken. Amathusiinæ: *Zeuxidia amethystus*, Butl., *Z. doubledayi*, Westw., and *Amnosia baluana*, Fruhst., were taken near our hut in the shady part of the jungle; *Thaumantis aliris*, Westw., the largest and most showy butterfly to be found in Borneo, except perhaps the big *Troides* species (Papilioninæ), was seen two or three times, once feeding on the remains of a dead chevrotain.

The Nymphalidæ noted were: *Cupha erymanthis lotis*, Sulz., *Cethosia hypsea*, Doubl. and *Neptis* spp.; *Hypolimnias anomala*, Wall., was common on the sunny paths at the foot of the mountain, and easily distinguished in flight and at rest from its Euplœine models, although both Euplœine and Nymphaline are characterized by a slow fearless flight. I noticed the *Hypolimnias* almost invariably settled (or else immediately oriented itself) so that its wings were outspread on a leaf with its head nearest to or actually on the edge of the leaf, the hinder part being nearest the base or midrib of the leaf; I suppose this position enables it to fly off at quicker notice, and it is thus less likely to be surprised. The dark Euthalias seemed to similarly orient themselves, and at first I thought it was in order to obtain the full glare of the sun, but came to the conclusion that the sun had nothing to do with it. Time after time I watched them fly towards a leaf, settle, "about turn," and there they were "facing the enemy" in the same way that *Hypolimnias* did. There is more point in this action with the Euthalias, as the males of the three commonest species in Sarawak have light blue-grey hind marginal borders to both wings, which effectively merge in the ground colour of the leaves on which they rest, thus leaving a

dark patch at the tip or edge of the leaf which might well be taken for a piece eaten out of the edge or off the end of the leaf. The females are less often seen, and I could make no observations on their rest attitudes.

The large Nymphaline, *Parthenos sylvia borncensis*, Staud., occasionally flew by at a great speed. One example of another swift-flying Nymphaline, rather Hesperid-like in flight, was taken, *Dicchoragia nesimachus mannus*, Fruhst.; this is a rare species in Sarawak. *Athyma nefte nivifera*, Butl., and *A. abiasa*, Moore, were common. *Adolias canescens*, Butl., was taken. The celebrated leaf-butterfly, *Kallima inachis buxtoni*, Moore, was seen to settle on the trunk of a tree, but it evaded capture.

LEMONIDÆ.—*Zemeros emesiodes eso*, Frust., and *Laxita orphua*, Boisd., both common species, were taken.

LYCENIDÆ.—*Megisba malaya*, Horsf., *Lycænopsis plauta*, Druce, *Neopithecops zalmora*, Butl., *Lampides zebra*, Druce, *L. coruscans*, Moore, *L. celeno*, Cr. (a dwarf measuring only 21 mm. across the wings), *Everes argiades*, Pall., *Dacalana vidua*, Horsf. (a pair taken in cop.), two examples of *Horaga affinis*, Druce, which is a rare mountain species confined to Borneo; and a male of the pretty little *Sinthusa amata*, Dist., also a rare species in Sarawak.

PAPILIONIDÆ.—The Pierines noted were *Terias hecabe*, L., *T. sari*, Horsf., *Catophaga pluna*, Butl., and *Delias metarete*, Butl., a specimen of this last species with a large piece removed from anal half of right hind wing and anal quarter of left hind wing, evidently bitten out by some bird or lizard enemy. Two species of Papilioninæ, *P. helenus palawanicus*, Staud., and *P. nephelus saturnus*, Guer., were frequently seen. A male of the former was taken with a large piece removed from the greater part of the left hind wing, and the inner margin of the right hind wing also bitten away. Another Papilio, *P. aristolochiæ antiphus*, Fab., was taken, showing a large symmetrical bite removing tailed portion of both hind wings.

Two Hesperids, *Tagiades waterstradti*, Elwes, and *Parnara moolata*, Moore, were taken.

The moths, so far as I can identify them from the collection in the Sarawak Museum, include the following. There are, however, many others which I have not been able to identify up to the moment of writing. The majority of the following were taken at light:—

SYNTOMIDÆ.—*Syntomis egenaria*, Wlk.

ARCTIIDÆ.—*Nishada rotundipennis*, Wlk., *Ilema tortricoides*, Wlk., *I. plagiata*, Wlk., *I. costalis*, Wlk., *I. apicalis*, Wlk., *I. vicaria*, Wlk., *Padenia duplicana*, Wlk., *Darantasia cuneiplena*, Wlk., *Chionæma pudens*, Wlk., *C. conclusa*, Wlk., *C. subornata*, Wlk., *C. bianca*, Wlk., *Asura obsoleta*, Moore, *A. cuneifera*, Wlk., *A. euprepioides*, Wlk., *A. stringipennis*, Sch., *A. bisonoides*, Wlk.,



Fig. 3



Fig. 4.

A. uniformeola, Hmps., *Miltochrista cuneonotata*, Wlk., *M. cruciata*, Wlk., *M. rubricostata*, Sch., *Eugoa æqualis*, Wlk., *E. vagitutta*, Wlk., *Hemonia orbiferana*, Wlk., *Diacrisia strigatula*, Wlk.

NOCTUIDÆ.—*Ancara obliterans*, Wlk., *Flammona quadrifasciata*, Wlk., *Toxocampa dorsigera*, Wlk., *Aquis viridisquama*, Wlk., *Doranaga leucospila*, Wlk., *Ariola continua*, Wlk., *Risoba diversipennis*, Moore, *Nyctipao crepuscularis*, L., *Baniana crinigera*, Swinh., *Bocula quadrilineata*, Wlk., *Remigia frugalis*, Fab., *Simplicia schaldusalis*, Wlk., *S. butesalis*, Wlk., *S. circumscripta*, Wlk., *S. robustalis*, Guén., *Adrapsa geometroides*, Wlk., *Bocana silenusalis*, Wlk., *Bertula cassiusalis*, Wlk., *B. alphasalis*, Wlk., *Nodaria nigripes*, Hmps., *N. erecta*, Moore.

LYMANTRIDÆ.—*Orgyia nigrocrocea*, Wlk., *Lymantria similis*, Moore, *L. albicans*, Wlk., *Euproctis guttistriga*, Wlk., *E. guttulatata*, Snell., *Redoa marginalis*, Wlk.

AGANIDÆ.—*Asota heliconia*, Butl.

SPHINGIDÆ.—*Daphnusa ocellaris*, Wlk.

CYMATOPHORIDÆ.—*Thyatira batis*, L.

NOTODONTIDÆ.—*Phalera sangana*, Moore.

GEOMETRIDÆ.—*Peratophyga venetia*, Swinh., *Luziaria ditrota*, Meyr., *L. undulataria*, Pag., *L. nigripalparia*, Wlk., *L. turpisaria*, Wlk., *Zamarada translucida*, Moore, *Hyposidra talaca*, Wlk., *Ophthalmodes clararia*, Wlk., *Boarmia compactaria*, Wlk., *B. costaria*, Guén., *B. separata*, Wlk., *Panæthia maculifera*, Wlk., *Pomasia vernacularia*, Guén., *P. conferta*, Swinh., *Craspedia walkeri*, Butl., *C. actuaria*, Wlk., *Problepsis deliaria*, Guén., *Agathea codina*, Swinh., *Hemithea graminea*, Hmps., *Thalera unifascia*, Hmps.

LIMACODIDÆ.—*Miresa bracteata*, Butl.

ZYGÆNIDÆ.—*Chaleosia ficta*, Wlk.

PYRALIDÆ.—*Ramila acciusalis*, Wlk., *Vitessa suradera*, Moore, *Ambia marginalis*, Moore, *Piletocera ægimiussalis*, Wlk., *P. tellusalis*, Wlk., *Mabra faucalis*, Wlk., *Eurrhyarodes bracteolalis*, Zell., *Agrotera effertalis*, Wlk., *A. barcealis*, Wlk., *Aetholix flavibasalis*, Guén., *Ercta elutalis*, Wlk., *Bocchoris telphusalis*, Wlk., *Dichocrocis clioalis*, Wlk., *D. pandamalis*, Wlk., *D. megillalis*, Wlk., *Nacoleia pæonalis*, Wlk., *N. insolitalis*, Wlk., *N. marionalis*, Wlk., *Sylepta multinealis*, Guén., *Glyphodes glauculalis*, Guén., *G. navalis*, Feld., *Pilocrocis anigrusalis*, Wlk., *Pionea aureolalis*, Led.

Among insects of other Orders captured or noticed were the following:—

RYNCHOTA.—Cicadidæ: *Scieroptera crocea*, Guér., and *Maua albiguttata*, Wlk. I think it was another example of this latter species that I tried to catch on a branch of a tree whither I had been attracted by its shrill song. It flew off and continued its song for a moment or two while in flight, much to my surprise, as I

always thought a position of rest was necessary before any Cicadas could make a noise. It returned later to the same tree, but I again missed it with the net, although it allowed me to approach near enough to approximately identify it.

Four Fulgoridæ were noted—*Thessitus nigronotatus*, Stål, *Pochazia fuscata*, Fab., *Ricania convergens*, Wlk., and *R. limitaris*, Wlk. Also five Cercopidæ—*Suracarta tricolor basinotata*, Butl., *Tricoscarta delineata*, Wlk., *Phymatostetha stellata*, Guér., *P. dislocata*, Wlk., and *Opistharsotheus simulans*, Schmidt. Specimens of the two common Jassids, *Bhandara semiclara*, Sign., and *Tettigoniella farinosa*, Fab., were brought in by the collectors. The Pentatomids, *Chrysochoris auratus*, Guer., *Dalpada oculata*, Fab., *Plautia fimbriata*, Fab.; the Reduviid, *Centrocnemis signoreti*, Stål; the Coreid, *Serinetha abdominalis*, Fab.; and a Lygæid, *Narbo biplagiatus*, Wlk., were taken.

COLEOPTERA.—Perhaps the most striking species taken were a large brilliant green Buprestid, *Chrysodema pyrosticta*, Vollen., and a fine chocolate-brown Curculionid, which I found walking on a large rock on the summit of the hill; this proved to be a rare species recently described by Dr. K. M. Heller as *Polriophorus stellatus*.

Among the Longicorns were—(Lamiidæ), *Leptoderma fimbriata*, Chev.; a large brown-spotted beetle, *Ilmiantocera plumosa*, Oliv.; *Entelopes glauca*, Guér., surely a mimic of some Coccinellid-Cassid combination; *Praonetha quadraticollis*, Pasc.; and a pair of a gorgeous blue species, *Glenea celia*, Pasc., which I took in cop. on a fallen tree. Mr. Gahan kindly identified it for me, and I understand it has not been recorded from Borneo before. (Cerambycidæ), the common red *Euryphagus lundii*, Fab., *Xylotrechus pedestris*, Pascoe, and *X. scenicus*, Pasc.

The brilliant little Cassidæ were represented by *Aspidomorpha sarawacensis*, Spaeth, and *Laccoptera 13-punctata*, Fab. Two species of Carabidæ were taken—*Orthogonius vittatus*, Main, and *Dischissus cereus*, McL., the latter a rare species in Sarawak. The pretty little Cicindelid, *Odontachila (Heptadonta) analis*, Fab., was common on the sandy path at the foot of the mountain, flying in the sun, together with the ubiquitous *Cicindela aurulenta*, Fab., which is certainly the commonest beetle in Sarawak.

One Endomychid, *Eumorphus consobrinus*, Gerst., and one Lampyrid, *Luciola pallescens*, Gorh., were taken.

Sugaring trees was tried, but, as on previous occasions out here, proved a total failure, possibly owing to moonlight nights, but more likely due to the swarms of ants which were always in a great hurry for first place. Among them was that large species, *Camponotus gigas*, Latr., of which the big headed soldiers, measuring an inch in length from head to end of abdomen, used to appear at night, though we never saw them in the daytime. One of the Dayak collectors, annoyed at seeing several visitors of

this kind instead of the desired moths, hit one with a stick, bursting the bladder-like abdomen, whereupon some fluid squirted out and into his eye! He had a very painful two days before his eye got all right again. A few earwigs attended the sugar repast; they were *Allodahlia scabriuscula*, Serv., *Cordax forcipatus*, de Haan, *Timomenus vicinus*, Burr, and *Opisthocosmia centurio*, Dohrn.—all common species in Sarawak.

Sarawak: April, 1912.

EXPLANATION OF PLATES V. & VI.

- Pl. V., fig. 1.—Mr. H. W. Smith and Dayaks on the actual site occupied by Wallace in 1856. Note two posts of house in foreground, and the density of jungle grown up since the house was last occupied.
 „ fig. 2.—The same spot after being cleared by Dayaks. Our hut in process of erection.
 Pl. VI., fig. 3.—Our improvised moth-trap. Collector (Sea-Dayak) standing with Land-Dayak boy seated in front.
 „ fig. 4.—The huge rock (referred to by Wallace, St. John, and Beccari), under which we obtained water for drinking and bathing purposes.

APPENDIX.

By W. L. DISTANT.

MR. MOULTON has asked me to identify the four following species of Rhynchota which he collected on this expedition, two of which are apparently undescribed, and the types are now in the British Museum.

Fam. PENTATOMIDÆ.

Dulpada trimaculata.

Pentatoma 3-maculata, Westw., in Hope Cat. i. p. 41 (1837).

Already recorded from Java, Sumatra, Borneo, and Philippines.

Hippotiscus scutellatus, sp. n.

Body above ochraceous, thickly darkly punctate; apex of scutellum cordately ivory white, inwardly margined with black; body beneath pale ochraceous, the segmental incisures, spiracles, and a transverse line beneath them dark castaneous; prosternum punctured with castaneous; legs darker ochraceous; head short, broad, almost shorter than broad between the eyes, rounded at apex, the margins moderately laminately reflexed, the lateral lobes slightly longer than the central; first joint of antennæ about reaching apex of head, second longer than third, fourth and fifth longest and subequal, first, second, and third joints ochraceous, fourth and fifth dark castaneous; rostrum castaneous, not extending beyond the intermediate coxæ; pronotum with the lateral margins rounded and laminate, anterior angles obtusely angulated, basal angles rounded and subprominent; membranous veins simple; abdomen not spined at base, but second segment

slightly convexly elevated at centre; mesosternum centrally carinate. Long. 13 millim. Exp. pronot. angl. 2 millim.

This genus was previously represented by a single Indian species.

Halyomorpha picus.

Cimex picus, Fabr., Ent. Syst. iv. p. 115 (1794).

A species common to the Oriental and Malayan regions, and found in China and Japan.

Glaucias montiragus, sp. n.

Above bright olivaceous green; head and anterior area of pronotum—concavely extending to the lateral angles—pale testaceous; head with the margins narrowly, a puncture on each side of the central lobe near eyes, and about four small spots near base, black; pronotum with about anterior half of the lateral margin blackly punctate, a few scattered black punctures on the pale testaceous area, and a series of black punctures on the anterior margin of the olivaceous green basal area; antennae with the first, second, and third joints virescent, apex of the third black, fourth and fifth subtestaceous, about apical third of fourth and nearly apical half of fifth black, third, fourth, and fifth joints subequal in length; body beneath and legs virescent, paler than above; abdomen with a series of small black spots on the lateral margins at the apices of the segmental incisures; posterior area of pronotum, scutellum, and corium thickly punctate; membrane pale, hyaline, rostrum with the apical joint mutilated in type, second and third joints almost equally long; mesosternum distinctly carinate. Long. 13 millim. Exp. pronot. angl. 7 millim.

In colour and markings allied to *Z. beryllus*, Fabr., var. *crassa*, Westw., but a smaller species with the head more slenderly elongate and considerably more narrowed at apex.

COLEOPTERA COLLECTED ON THE J. C. MOULTON EXPEDITION
TO SIRUNBU (SARAWAK).

(Determined by C. J. Gahan.)

LONGICORNIA.—*Glenca pustulata*, Thoms. (one female). *Pterolophia* sp. (one male?); *melanura*, Pasc., var.

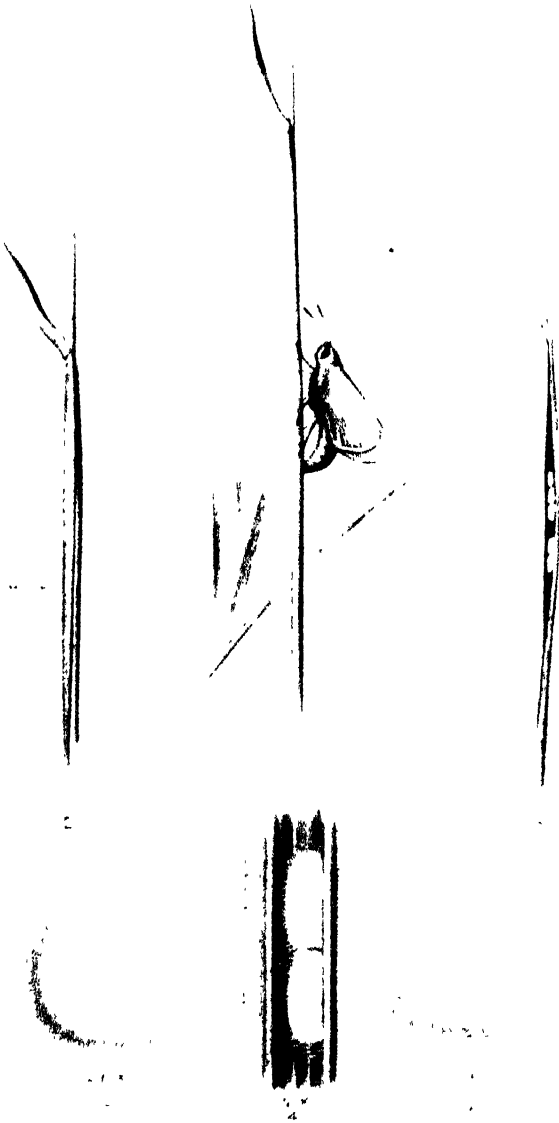
HALTICIDÆ.—*Chalænus* sp. (one male); not in B. M. Coll.

CARABIDÆ.—*Iesticus* sp. (two males, one female); not in B. M. Coll.

CURCULIONIDÆ.—*Poteriophorus bowringi*, Waterh., var.

(Determined by J. J. Arrow.)

RUTELIDÆ.—*Peltonotus vittatus*, Arrow. The two female specimens differ slightly in marking from the unique type in M. Oberthür's collection. The male must be awaited for the positive determination of the species (J. J. A.)



F. W. Frohawk del.

West Newman proc.

EARLY STAGES OF *HESPERIA LINEA*

ON THE EGG-LAYING AND EARLY STAGES OF *HESPERIA LINEA* (= *THAUMAS*)

By F. W. FROHAWK, M.B.O.U., F.E.S.

(PLATE VIII.)

AFTER repeated attempts to obtain the eggs of *Hesperia linea* from captive females, I determined, if possible, to watch this species depositing in a state of nature, not only for the purpose of securing eggs, but to ascertain the cause of so many failures in trying to get them to lay in captivity. I therefore, in company with my friend Mr. Ed. Goodwin, visited a certain locality on the Kentish Hills, where this butterfly is abundant, on July 17th last, purposely to make observations on this species, and to collect the larvæ of *Lycæna minima*. After watching *Hesperia linea* for a short time, we soon had the satisfaction of seeing three females deposit between 3.45 and 4.30 p.m., and found the eggs of each. To lose no opportunity I made a sketch on the spot of the first female we saw in the act of depositing, the drawing of which is reproduced in the accompanying plate.

The two species of grass selected by the butterflies for their eggs were cat's-tail grass (*Phleum pratense*), and soft creeping grass (*Iolcus mollis*). All three females went through precisely the same performance and mode of depositing. After flying with a slow, steady, buzzing flight in and out among the taller stems of the mixed grasses growing in a dense mass of varied herbage in a wild uncultivated sheltered slope on a chalk hill, the butterfly now and again settled for a moment on a grass-stem, but obviously not suited for its eggs, would quickly fly off and settle on another, if suitable; she would settle on the upper sheath, and immediately slide down tail first, and at once start feeling for the division along the sheath with the ovipositor, working partly or wholly round it, and slowly crawling upwards during the process until it found the exact place to suit its requirements, in the choice of which it seemed very particular; it then rested with its wings closed over its back, antennæ lowered in a line with its body, and the abdomen curved, with the extremity closely pressed on, or just in, the crevice of the sheath, and the ovipositor deeply inserted. In this attitude she remained for three or four minutes, when I sketched her. While thus resting she laid four eggs in a row along the inner surface of the sheath opposite the aperture, quite hidden from view.

After watching this one we noted both the other females behaved precisely the same in their actions. The first one laid four eggs, the second three, and the third one three; but I found six were laid close together in one sheath, but afterwards these proved to be the eggs of two females, as three of them hatched several days in advance of the others. It appears that the

normal number of eggs laid at a time is from three to five, as I afterwards gathered some grass-stems in which I found fourteen more eggs, all laid in rows in three different sheaths of five, five, and four respectively. After depositing the butterfly gradually raises the abdomen from the grass-stem, opens its wings, and after resting about a minute flies off.

I also captured six females for the purpose of obtaining more eggs; these, as well as others, I placed on growing plants of *P. pratense* and *H. mollis*. On July 31st I examined the plants, and found in the sheaths over fifty eggs, laid in a similar way to those laid by the wild females, but not a single egg was laid on any other part of the plant.

In previous trials to obtain eggs I had only provided the butterflies with younger growing plants without flowering stems, and as this species will only deposit its eggs in the sheaths of the flower-stalks, the cause of failure is at once apparent.

The egg of *H. linea* measures $\frac{1}{30}$ in. across its greater diameter, of a compressed oval shape, about half the width in height; it is much more rounded in form than either *H. actæon* or *H. lincola*. The micropyle is rather sunken and finely reticulated, and the rest of the surface is covered with extremely delicate reticulations of an irregular network pattern, which is only practically visible in high light; otherwise the shell has the appearance of being smooth and glistening with rather an opalescent lustre.

When first laid it is pearly white, faintly tinged with primrose-yellow. It remains unchanged for some days, and then gradually becomes a deeper ochreous yellow, afterwards again becoming paler, of a greyish pearly hue, when the larva is clearly visible through the delicate shell, its dark head showing as a leaden blotch.

Some of the wild eggs found on July 17th started hatching on August 3rd; those laid on that day (July 17th) began hatching on August 9th, remaining twenty-three days in the egg-state.

The young larva directly after emergence measures while crawling $\frac{1}{4}$ in. long. The head is pale olive-ochreous, roughly granular, and beset with a few white hairs; eyes pale, surrounded with blackish; the clypeus outlined with dark brown. The body is stoutest in the middle and tapering posteriorly; on the first segment is a dorsal, transverse, chitinous band of a similar surface and colour as the head. The segments have five subdivisions, the first on each segment being the widest; the second one runs below the spiracle, where it curves and runs off to the anterior segmental division. There are three subdorsal shining brown discs, each bearing a minute curved hair, placed in a triangle on each segment above the spiracle, and two others below; a few minute simple hairs are scattered over the ventral

surface and on the anal extremity. The surface is roughly granulated, and of a pale citron-yellow colour.

The larva eats almost all the shell after emerging, only leaving a portion of the base adhering to the surface of the sheath. Shortly after emergence the young larva commences spinning itself over with silk until it is completely enveloped in a little dense, elongated oval, white cocoon, spun in the same spot where the egg is laid, so that a row of cocoons takes the place of the eggs, the little larvæ not moving from where they hatched. In these compact cocoons the larvæ are completely hidden and protected for hibernation. In this respect, excepting its near ally, *H. actæon*, which I shall later on fully describe, this very remarkable habit of *H. linea* is unique among our native butterflies, and is a wonderful provision for the preservation of the species; as the eggs are but slightly fixed to the surface of the sheath on which they are laid, they become detached if only very lightly touched, and upon the decaying of the grass during winter, when it would become fractured and split up, the eggs would fall out and perish on the ground in consequence; but Nature has provided safety for the species by the self-preservation of the larva to construct an indestructible covering incapable of dislodgment from its site, in which it can safely remain concealed throughout the winter months, and in the spring, when the fresh, tender blades of the grass-plant spring up among the fallen flower-stalks and sheaths, the little larva, on awakening, can then find its natural food—at least, this appears to me to be the obvious reason of the necessity of this wonderful provision.

In Buckler's 'Larvæ of British Butterflies,' pp. 195-6, Hellins states that on July 29th, 1865, Dr. Knaggs sent him "the eggs of this species laid in a row in folded grass, but how he managed to get the butterfly to lay them I do not know. The larvæ hatched on August 12th; most of them soon disappeared, but one survived until the middle of November; it was then only about 2 mm. in length, so I must have mismanaged it." Also he mentions being unable to obtain a single egg from numbers of these butterflies in captivity; but the first egg he squeezed from each dead butterfly proved fertile, and "the larvæ began to hatch August 15th; they soon spun little ropes of silk across the blades of grass, and made little web coverings for themselves, but they would not feed, and an accident soon befel their cage, and I saw them no more."

Both from Hellins' description of the egg and his account of the site of egg and habits of the young larvæ, it is not at all conclusive if he had under observation *H. linea* at all, although it appears impossible that he could be mistaken in the identity of the specimen he squeezed eggs from; but one point is, I think, certain, viz. he described the egg of *H. actæon* for that of

H. linea, which he describes "of a long oval figure half as long again as wide," which is correct for the egg of *actæon*, that so greatly differs in this respect from the egg of *H. linea*, which is so very much rounder in form, being only one-fifth longer than broad, whereas that of *H. ætæon* is, as Hellins states, half as long again as wide. For the purpose of comparison I have given figures of the eggs of both species. As will be seen, the difference in shape between the two is so vastly different that it affords a ready means for immediate identification.

(To be continued.)

EXPLANATION OF PLATE VIII.

Fig. 1.—*Hesperia linea* depositing; flower-stem of *Phlœum pratense* sketched from life, 3.45 p.m., July 17th, 1912.

Fig. 2.—Flower-stem sheath of *Holcus mollis*; arrow-head denoting eggs *in situ* within sheath.

Fig. 3.—Larval cocoons (natural size); sheath opened to show cocoons.

Fig. 4.—Larval cocoons, enlarged 4 ×.

Fig. 5.—Egg of *H. linea*, enlarged 29 ×.

Fig. 6.—Egg of *H. actæon*, enlarged 24 ×.

OVIPOSITION OF *TAPINOSTOLA CONCOLOR*.

By G. B. KERSHAW, F.E.S.

WHILST working for this insect this year, about 8.45 p.m. I came across a female, evidently freshly emerged, clinging to a sedge-leaf. At 9.30 p.m. a male of the same species came up and paired with the female. After an interval of ten minutes the pair were very carefully secured in a three-inch glass-bottomed pill-box, together with the sedge-leaf on which they were resting; they were then left on the ground, still paired, until 1.30 a.m. the next morning, when they were found separated.

Both the insects were transferred to a large glass jar covered with muslin and containing a good supply of food-plant, the cut stalks being wrapped in wet cotton wool to avoid shrivelling. On examining the sedge-leaf cut off by the pill-box lid (referred to hereafter as "A"), it was seen to be dried up, and the edges were curled over towards the middle of the leaf on each side; on gently opening the curled-up portions, thirteen ova were found concealed on one side of the leaf, all neatly deposited in a row, touching each other, and cemented to the leaf.

The ova were globular, glistening, and of a yellowish white colour, and measured about one thirty-second of an inch in diameter. The insects in the glass jar were placed amongst herbage during the day, and hid up amongst the sedge close to the bottom of the jar. They were visited several times during the day, but did not move until about 9 p.m. on the evening

following their capture, when one of the insects (the male, as it subsequently turned out) became restless, and commenced "buzzing" up and down the sedge-leaves, the female remaining perfectly quiescent. The male was then removed to a second glass jar supplied with sedge. About 9.30 p.m. the female began to ascend the sedge, creeping quietly about examining the blades, and having finally selected a particular blade as being suitable for her purposes, commenced ovipositing about one and a half inches from the extreme tip, and along the very edge of the leaf. About this time the light became too uncertain for further observation, and on trying to observe further with a lamp, the female commenced "buzzing," so she was left undisturbed, whilst the male in the second jar was killed. The following day, about 8 a.m., the ova which I had seen deposited the previous evening were invisible, the leaf having curled over and completely hidden them from view. The sedge had already dried somewhat, but doubtless the cement provided by the female during oviposition hastened during its setting period the curling of the leaf.

After being left undisturbed (after a railway journey) for five days, the female still being alive but much worn, she was removed and the sedges carefully searched for ova. Several batches were found, five in all: two lots ("B" and "C") were laid about the middle of a blade, and three ("D," "E," and "F") about one and a half to two inches from the extreme tip. In batch "B" the ova (sixteen in all), were laid in two rows parallel to and touching each other, and this was also the case with "C," five ova being laid. With respect to "D," the ova (seven) were similarly placed to those in "A," but with "E" and "F" (seven and eleven respectively) one ovum, although in the same straight line as the others, was separated from the main row by an interval of one-eighth of an inch.

Several of the ova appeared either to have shrunk or to have been distorted by the pressure of the incurling leaf, and this would appear to afford strong presumptive evidence that the cement or gum greatly accelerates the curling tendency of the leaf, since one might reasonably assume that the distortion of the ova occurs soon after this is deposited, *i. e.*, when the envelopes of the ova are still delicate and flexible.

The double row of ova at the middle of the leaf "B" (*i. e.*, where the breadth is about four times that of the leaf one and a half inches from the extreme tip) is significant.

With reference to "E" and "F" it would appear possible that the female inserted her ovipositor into the blade when it was already somewhat curled, and after laying one egg for purposes of taking bearings at, so to speak, the limit, withdrew the ovipositor an eighth of an inch before laying the remainder.

The weather the evening the insects were taken was very

warm and close, following heavy rainfall, the shade temperature at 8 p.m. being 68° F.

It remains to be seen whether it will be possible to observe anything further with regard to the life-history of this insect, since the accredited food-plant is not particularly easy to obtain, and difficult to transplant when met with.

West Wickham, Kent.

NEW SPECIES OF LEPIDOPTERA FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

GEOMETRIDÆ.

Paradarisa rantaizanensis, sp. n.

♂. Fore wings pale brown, freckled with darker, clouded with dusky on outer third, ochreous tinged, especially on costal and dorsal areas; antemedial line blackish, double, diffuse; postmedial line blackish, angled opposite cell, bent near dorsum; discoidal mark linear, blackish, some blackish specks between it and dorsum; subterminal line pale, wavy, indistinct; terminal line crenulate, blackish, with black dots on it between the veins. Hind wings pale brown, freckled with darker; antemedial line blackish, only distinct on dorsal area; postmedial line blackish, double, not extended to costa, slightly incurved before dorsum, followed by a dusky shade; subterminal and terminal lines as on fore wings, but the former rather more distinct. Under side whitish, clouded with dusky on outer third; all the wings have blackish discoidal spot and postmedial line, the latter rather faint.

Expanse, 43 millim.

Collection number, 789 a.

Allied to *P. comparataria*, Walker, from N.W. Himalayas.

A male specimen from Rantaizan, May 8th, 1909.

Arichanna (?) *maculosa*, sp. n.

♂. Antennæ bipectinate. Fore wings white, thickly sprinkled with dark brownish; venation brownish; antemedial and postmedial lines blackish, double, broad and rather wavy, interrupted; a blackish band, on which is a black discoidal spot, between antemedial and postmedial lines, but nearest the latter, interrupted about middle; subterminal and terminal lines blackish, macular; a blackish cloud on terminal area near apex. Hind wings white, finely sprinkled with dark brownish. Fringes of all wings whitish checkered with blackish, most distinctly on the fore wings. Under side similar to above, but the transverse markings of the fore wings confluent.

♀. Except that the hind wings are more densely sprinkled with dark brownish, similar to the male.

Expanse, 39 millim.

Collection number, 806.

One specimen of each sex from Arizan, September 12th, 1906.

Vindusara rectifascia, sp. n.

♀. Fore wings white; antemedial and postmedial bands pale brownish, powdered with white, the former curved and the latter straight; a pale brownish spot before antemedial line, and two similar coloured spots on costal area just beyond the antemedial, and two or three others beyond the postmedial band. Hind wings white, with four large and some small scattered pale brownish spots on the basal three-fourths; postmedial band pale brownish, outwardly edged by a yellowish cloud in which are three black dots, extending to termen between vein three and tornus. Fringes of all wings brown. Under side similar to above, but there are more spots beyond the postmedial band of fore wings.

Expanse, 50 millim.

Collection number, 1561.

A female specimen from Kanshirei, May 7th, 1908.

Pachyodes taiwana, sp. n.

♂. Antennæ bipectinated, except apical fourth; abdomen with flattened tufts of brownish hairs on middle segments. Whitish grey, sprinkled with brownish grey, and striated with blackish. Fore wings with black basal and antemedial lines, both slightly curved near costa, thence almost straight to dorsum, space between the lines without black striae; discoidal mark black, linear; postmedial line blackish, wavy, diffuse towards costa, bluntly angled above middle, incurved below middle; subterminal line blackish, indistinct, followed by whitish patches below apex and about middle; terminal line black, interrupted. Hind wings have blackish discoidal mark and postmedial line, the latter bluntly angled at vein four, thence wavy to dorsum; terminal line black, interrupted. Under side white; a black postmedial band on all the wings, the outer edge of the band irregular; a black discoidal mark on fore wings similar to that on upper side.

Expanse, 48-50 millim.

Collection number, 1555.

Near *P. crassistriga*, Warren.

Two male specimens from Kanshirei, April 28th, 1908.

NOTODONTIDÆ.

Phalera flavimacula, sp. n.

♂. Head chocolate-brown, crown yellowish buff, collar chocolate-brown mixed with grey; thorax pale grey flecked with darker; abdomen grey, anal tuft yellowish buff. Fore wings pale grey, striated and mottled with darker grey, clouded with dark grey on the costal area; some black dots on costa before apex; reniform and orbicular spots pale, outlined in black; a black mark below the orbicular spot; a patch of yellowish buff on terminal area, inwardly bordered by a chocolate-brown curved band; fringes reddish brown, traversed by a greyish line, preceded by a connected series of black lunules. Hind wings whitish suffused with fuscous, except on dorsal area; discoidal spot and postmedial line dusky. Under side blackish,

with yellowish buff patch as above, on fore wings; whitish, freckled with brown chiefly on costal area, black discoidal spot, and blackish somewhat interrupted postmedial line, on the hind wings.

Expanse, 40 millim.

One male specimen from Arizan.

NOCTUIDÆ.

Trachea subfusca, sp. n.

♂. Fore wings greyish brown, suffused with fuscous; four pale brown dots on costa towards apex; orbicular and reniform stigmata hardly paler than the general colour, partly outlined in black, space between them blackish; antemedial line black, sinuous, indistinct towards dorsum; postmedial line black, dentate, curved round end of cell, outwardly edged with pale brown: veins marked with black on terminal area; subterminal line pale brown, fairly distinct on costa, continuation indicated by dots on the veins. Hind wings pale brown, suffused with blackish, fringes paler. Under side pale brown, powdered with darker, chiefly on fore wings and outer area of hind wings; a dusky postmedial line on all wings, and a blackish discoidal spot on hind wings; four pale brown marks on costa of fore wings beyond postmedial.

♀. Similar to the male, except that the antemedial line is more distinct.

Expanse, ♂ 46 millim.; ♀ 48 millim.

One example of each sex from Kanshirei; male, August 14th, 1907; female, August 17th, 1905.

NOTES ON THE BRITISH MOSQUITOS (CULICINÆ).

By F. W. EDWARDS, B.A., F.E.S.

(Published by Permission of the Trustees of the British Museum.)

(Concluded from p. 220.)

Genus 3. *ÆDES*.

A. cinereus, Mg.—Scales of head broad and flat, except for a patch of narrow ones behind, extending in front in a narrow median area to the eyes. Scales yellowish, but two patches of black ones, variable in size. Thorax reddish, clothed with golden-brown scales. Abdomen blackish-brown above, sides and venter pale ochreous. Legs and wings with dark brown scales, femora pale beneath. Average length, 5 mm.

Probably fairly common. I have seen specimens from Wicken, Chippenham, and Baitsbite (Cambs); New Forest; Bournemouth; Studland (Dorset); Crymlin Bog (Glamorgan); Ormesby (Norfolk). Mr. J. E. Collin has it from Tuddenham (Suffolk) and Edinburgh.

There may be two nearly allied species here, as Theobald describes the hind claws as being simple; this, however, is very likely an error. Kertész states that they are toothed, and this agrees with my observations. A specimen of Zetterstedt's *Culex nigrifrons* lent to me for examination was a typical *A. cinereus*; this confirmed a suspicion I had previously entertained that the two names apply to the same species.

Genus 4. TĒNIORHYNCHUS.

1. *T. richiardii*, Fic.—A rather obscure-looking insect, but easily distinguished from the other British species by having *all* the wing-scales rather broad; the wings are speckled as in several species of *Ochlerotatus*. Thorax reddish-brown, with golden-brown scales. Abdomen blackish, unbanded, but with pale lateral spots. Legs speckled; indistinct pale rings at the bases of the tarsal joints, and in the middle of the metatarsi. Length about 6 mm.

Not common. Patching and Angmering ponds, Sussex, and Littlesea, Dorset (*Rev. A. E. Eaton*); Cambridge (*F. Jenkinson*); Sutton Coldfield (*R. C. Bradley*); Wye, Kent, and Norwich (*Theobald*).

Theobald's record of this species from Toronto really refers to *T. perturbans*, Walk., which is distinguished from *T. richiardii* by having a pale ring near the apex of the tibiae. The name of this species is spelt wrongly in Theobald's monograph, and in the 'List of British Diptera' (1901).

Genus 5. THEOBALDIA.

1. *T. annulata*, Schrank.—Wings spotted as in *A. maculipennis*. Cross-veins in one line. Femora with narrow pale rings near the tip. Broad whitish rings at the base of each tarsal joint, and in the middle of the metatarsi. Segments of abdomen brown with whitish basal bands, the second segment with a median whitish longitudinal stripe. Average length, 7.5 mm.

Common. A particularly bad biter.

2. *T. morsitans*, Theo.—Wings unspotted. Cross-veins separated by nearly the length of the posterior. Proboscis and palpi of female black-scaled, the palpi white-tipped. Scales of thorax partly dark brown and partly golden, the golden ones tending to be arranged in longitudinal lines. Abdomen dark brown, the segments with broad whitish basal bands. Femora without pale rings. Tibiae and metatarsi striped with yellowish white on the sides. Tip of metatarsus and second tarsal joint narrowly yellowish, broader yellowish areas at the bases of the first three, narrower ones at the bases of the last two tarsal joints. Metatarsus of the front legs of the male distinctly longer than the remaining four joints together (120:105). About seven teeth in the pecten of the air-tube of the larva, no spines beyond the pecten. Average length, 6.5–7.5 mm.

Probably common. Rochford, Essex; Patching and Angmering, Sussex; Woking, Surrey; Brockenhurst, Hants; Longner Hall, Shrewsbury.

3. *T. theobaldi*, Meij.—The adults are difficult to separate from those of *T. morsitans*, though the larvæ are very distinct. In the male of *T. theobaldi* the front metatarsus is scarcely at all longer than the remaining four joints together. In the female the proboscis has numerous pale scales, especially in the middle at the sides. Eight or nine teeth in the pecten of the larval air-tube, placed more transversely than in *T. morsitans*; five or six spines beyond the pecten. Meijere states that the larva is yellowish or greenish white, while that of *T. morsitans* is blackish grey. He also says that the air-tube of the larva of this species is relatively shorter and broader, but I do not find this to be the case. Figures 3 and 4 represent the larval air-tubes of *T. morsi-*



Fig. 3.—*Theobaldia theobaldi* (Meij.). Air-tube of larva.

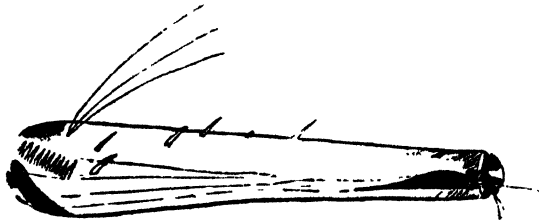


Fig. 4.—*Theobaldia morsitans* (Theo.). Air-tube of larva.

tans and *T. theobaldi* respectively; they were drawn by my wife from specimens taken in the New Forest by Mr. C. O. Waterhouse, and mounted in balsam.

Quite as common as *T. morsitans*. Has been taken in Scotland at Dingwall, Cromarty (Lt.-Col. Yerbury).

The specimens described by Theobald (Mon. Cul. i. p. 335) as *Culex ficalbii* (so named by Prof. Grassi) are *T. theobaldi*, and were certainly, I think, wrongly named, as *C. ficalbii* was originally described as having spotted wings. Specimens answering Noë's description have been received at the British Museum from the Punjab; one of these was recorded by Theobald as *C. annulatus*. It is improbable that the true *Th. annulata* occurs in India.

Genus 6. *CULEX*.

1. *C. pipiens*, L.; the Common Gnat.—Thorax brick-red to dark reddish-brown. Abdomen dark brown, the segments with basal yellowish bands. Legs dark brown, the femora pale beneath. First fork-cell very long, quite four times as long as its stem. Average length, 5 mm.

Common everywhere.

A small dark variety (?) of this species has been described by Theobald as *Culex nigritulus*, Zett. It is certainly not *C. nigritulus*, which is a synonym of *Aedes cinereus*, Mg. At first sight this variety appears to be totally distinct from *C. pipiens*, as it is much smaller (only 3–3.5 mm. in length) and darker, the thorax being without any roddish tint. No external structural differences, however, are observable, and after carefully comparing the larvæ of this and typical *C. pipiens* I could find no differences whatever. However, it seems worthy of a name, varietal if not specific, and I propose to call it *C. pipiens* var. *dolorum* (nov.). I found it swarming in water-barrels at Kingswear, South Devon, last autumn; all the adults were of uniform small size and dark grey-brown colour. The male genitalia differ from those of typical *C. pipiens* in having the basal process of the harpes quite well developed; I cannot detect the small third plate of the harpagones described by Dyar and Knab as characteristic of *C. pipiens*.

REPUTED BRITISH SPECIES.

Stephens records the following as British, but no recent examples have been found:—*Culex calopus*, Mg.; *C. ornatus*, Mg.; *C. domesticus*, Germar; *C. bicolor*, Mg.; *C. punctatus*, Mg.; *C. lutescens*, F.; *C. rufus*, Mg. With the exception of the first two, these have not been recognized by any recent author. Theobald regards *C. punctatus* as synonymous with *C. rusticus*, Rossi, and it was included in the last British List under this name.

Culex fumipennis, Stph., and *C. marginalis*, Stph., were originally described from Britain, but are probably unrecognisable unless from types.

KEY TO THE KNOWN LARVÆ OF BRITISH CULICINÆ.

- | | |
|--|--------------------------|
| 1. Air-tube absent | <i>A. maculipennis</i> . |
| Air-tube present | 2. |
| 2. Air-tube quite six times as long as its breadth in middle | 3. |
| Air-tube at most four times as long as its breadth in middle | 5. |
| 3. Several scattered hair-tufts on air-tube | <i>Culex pipiens</i> . |
| Only one tuft of long hairs close to base | 4. |
| 4. Five or six smooth spines on air-tube beyond pecten | <i>Th. theobaldi</i> . |
| No spines on air-tube beyond pecten | <i>Th. morsitans</i> . |

- | | |
|---|--|
| 5. Hair-tuft close to base of air-tube; pecten teeth hair-like | <i>Th. annulata</i> . |
| Hair-tuft near or beyond middle of air-tube; pecten teeth not hair-like | 6. |
| 6. Air-tube quite four times as long as broad; hair-tuft well beyond middle | <i>A. cinereus</i> . |
| Air-tube less than four times as long as broad; hair-tuft near middle | 7. |
| 7. Pecten of air-tube with detached teeth outwardly | <i>O. vexans (sylvestris)</i> . |
| Teeth of pecten evenly spaced | 8. |
| 8. Hair-tuft in a line with the pecten | 9. |
| Hair-tuft not in a line with the pecten | <i>O. diversus</i> . |
| 9. Pecten with about 24 teeth, each with 4-6 serrations | <i>O. cantans</i> . |
| Pecten with about 18 teeth, each with 1-2 serrations | <i>O. nemorosus</i> and <i>O. dorsalis</i> . |

The above table is mainly drawn up from specimens preserved in balsam by Mr. C. O. Waterhouse, taken in the New Forest and at Burnham Beeches. The larvæ of *O. vexans* have not been found, as far as I am aware, in Europe, but as the North American *sylvestris* is almost certainly the same, I have made use of the characters given for it by Dyar and Knab.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S., &c.

(Continued from p. 229.)

AUGUST 23rd was fine and warm. A boy brought me a fine large female *Sphinx convolvuli* which he had found on a bush. It was in a large wide-mouthed pickle bottle, had sustained no injury, and looked as if it had only just emerged. The first *T. amataria* of the brood mentioned on the 15th inst. appeared on the 23rd. Eleven others were bred subsequently, and the remaining larvæ are hibernating.

Of two rather large broods of larvæ of *Acidalia emutaria*, from ova laid by females taken early in July, only six larvæ fed up; the first moth came out on the 24th, and the last not until Sept. 26th. The other larvæ are hibernating. I do not think that this is an easy species to get through the winter, as I have tried several times and have always failed; some kind of fungus attacks the larvæ. Another *L. favicolor* was bred on the 24th; in all I bred twenty-eight, the last one as late as Nov. 8th.

The 26th was fine and warm, with sun and cloud and a light westerly breeze. A female *P. napi* which was sent to me alive from the South of Ireland deposited about forty eggs upon a plant of black mustard, and I hope I may breed one or two of the dark *bryoniae*-looking females next spring. As it was a very favourable evening for sugaring I went to the lanes and marshes, and, as I anticipated, moths swarmed, twenty to forty on each patch of sugar, the ground below being sprinkled with those that had fallen off. The most numerous were *pallens*, *c-nigrum*, and *xanthographa*—the two former very small examples, particularly the *pallens*, some of which are smaller than any I have ever seen. This seems to be the result of the hot dry summer, causing perhaps a shortage of food; the larvæ fed up more rapidly than usual, second broods appearing earlier this year than they generally do. Among the *pallens* were several of the red variety, some of them very bright. Other species seen or taken were *N. plecta*, *A. suffusa*, *A. segetum*, *G. libatrix*, *M. maura*, *C. nupta*, *A. tragopogonis*, *C. vetusta*, *P. meticulosa*, *T. pronuba*, *X. polyodon*, *Il. micacea*, *Il. paludis* (very much worn), and four of the red variety of *L. faricolor* (second brood).

The 28th was another favourable night for sugar, very warm and oppressive, with a little fine rain occasionally. Moths were in the greatest abundance; I have never seen anything like it before, the patches of sugar were quite hidden by them, and they kept fighting and pushing each other about, but they seemed to be rather light-shy and flew off in swarms directly the rays of the lamp were turned on them. It was also difficult to box any particular insect I wanted among the crowd, for as often as not when the box was held under it three or four undesirables would flop in at the same time. A great many were attracted to my light, and when I placed it on the ground while boxing an insect off a blade of grass, &c., dozens would come dashing against the glass. These were chiefly *Luperina testacea* and *Epineuronia popularis*. The swarms to-night consisted of the same species that I obtained on the 26th; the best were three *L. faricolor*, there might have been others, but among the crush it was difficult to distinguish them.

The 30th was a fine warm night. I went to the lanes and marshes again. There were scores of moths on the sugar, but nothing like the number there had been on the 28th. They were mostly the same species, with the addition of *Amathes* (*Orthosia*) *circellaris*, *Agrotis saucia*, and *Calamia lutosa*. It was rather early for the latter, but it had been out for some days, as its wings were rubbed and split.

The first day in September was fine, bright and hot. I went to a lucerne field in the morning, where I saw and caught two *Pyrameis cardui*—one very fine, the other damaged; these were, I suspect, immigrants, as was also *Plusia gamma*, of which I

noticed a good number flying among the flowers—there were none about a day or two earlier. There were a lot of fresh *Vanessa urticæ* and *Chrysophanus phlæas* and another brood of *Acidalia incanaria*. I fancy there is a succession of broods of this little species in warm, dry summers.

On the 2nd I took three more *P. cardui* on flowers of sea-aster—two were good, the other torn. The larvæ of *Euclidia* mi were now full-grown on seeds of coarse grasses; they are sometimes easy to see when stretched out to their full length on a stem, but are best obtained by sweeping.

On the 3rd the larvæ of *C. phlæas* that hatched out on the 16th of last month were now spinning up. *Amathes litura* was bred.

On the 4th I sugared on the coast, where *Noctua xanthographa* was in such countless numbers it drove everything else off. The other species present were the same as noted on previous nights, with the addition of two *Agrotis vestigialis*, one of which is the smallest example of this species I have ever met with.

On the 5th I saw six, and netted five, *P. cardui*; also saw three *P. atalanta*, the first noticed this year. *C. phlæas* was out in large numbers.

The 6th was a bright hot day. I visited some lucerne fields. Saw three *P. cardui* and netted two, also two fresh *V. io*. This butterfly has been very scarce this year, though it swarmed last season. I noticed a small white *Noctua* flying among the lucerne flowers, and upon netting it found it was a very small *L. pallens*. From fleabane I beat a very small *Ebulea crocealis*, evidently one of a second brood.

On the 7th a large male *Sphinx convolvuli*, which had been taken in one of the machine shops at Parkeston, was brought to me, but it was too much damaged to be of any use. I saw three, and captured one *P. cardui* on the salterns on flowers of sea-aster, also one *P. atalanta*, a very worn specimen. *C. phlæas* was very numerous on the aster flowers; I always examine them carefully on the chance of a variety, and got a nice dark ab. *eleus*. [The female *Dasychira pudibunda* which I took on May 27th laid a lot of eggs; these I sleeved out in the wood on June 2nd, and upon examining the larvæ on June 27th found them very small, and brought about a dozen home. On July 31st I examined the sleeve again, and found the larvæ were still very small, and nearly all the leaves were eaten, so I brought them home, and they were still feeding on Sept. 7th—some nearly full-grown while others were small. How many times does this larva change its skin? they seem to be always doing it.] I visited the woods this evening; it was still and close with a bright moon and heavy dew and a slight ground fog in the valleys. A good many common species visited the sugar, also

one *Acronycta rumicis*—a second or third brood, several *T. pronuba* and *L. pallens*, and a few *Hadena protea*.

8th.—A female *S. convolvuli* in a very rubbed condition was brought to me; it had been taken off some palings. I went to the marshes and reedy dykes at dusk. Moths were swarming on the reed-blossom, but it was rather hard to distinguish them, as there was a strong breeze and the reeds kept swaying to and fro. As far as I could make out, they were chiefly *Noctua xanthographa*, *N. c-nigrum*, and *L. pallens*, with an occasional *H. micacea*, *H. paludis*, and *A. suffusa*.

On the 12th another fine female *S. convolvuli* was brought to me. It had been taken off some washed clothes hanging up to dry in a backyard. I took a rather nice variety of *C. phlæas* with extra large blue marginal spots on hind wings. The larvæ of *Homæosoma senicionis*, or *binævella*, were now rather numerous spun up in flowers of ragwort; both species occur here.

On the 13th another *S. convolvuli* was brought in. It was taken resting on a coal-truck at Parkeston, and had been very roughly handled. One *Gortyna flavago*, one *Ennomos tiliaria*, and two *Tortrix podana* were taken at the electric lights, Parkes-ton; the latter must be a second brood.

The 15th was fine, sun and cloud, getting cooler. I saw several *T. podana* in our garden amongst *Euonymus* bushes, also many fresh *Pararge megera* on an old railway-bank—these must have been a partial third brood. I had seen several *A. incanaria*.

On the 17th the first *C. phlæas* was bred from ova laid by the female taken the beginning of August; about fifty were bred from this brood, the last appearing on October 10th, and there was not a decent variety among them. *Macroglossa stellatarum* was seen in our garden. This is a rare moth here, and I have not met with one for some years. Its favourite food-plant, *Galium verum*, does not occur here.

The 19th was fine and bright and warmer. I went to the woods to look for larvæ among young aspens, but there were hardly any to be seen; I only found one *Notodonta ziczac*, one *Dasychira pudibunda*, and one *Nephopteryx hostilis*, and scarcely any larvæ are to be obtained by beating. I had a great surprise, namely, at seeing six or seven fresh *Limenitis sibylla*. (An account of this appeared in the 'Entomologist' for October last, p. 327.)

The 20th was rather overcast and cool. I tried sugar in the evening; there were very few moths, but I noticed *Amathes pistacina* for the first time, and several of a second brood of *Agrotis puta*.

The 23rd was fine and bright in the morning, but clouded over during the afternoon, and rain set in at 10 p.m. At the end of July I had obtained a batch of ova of *A. emarginata*, of which the larvæ fed up well upon knotgrass, and the first moths,

four in number, emerged to-day. (About forty were bred altogether, the last appearing on October 17th. None of the larvæ attempted to hibernate.) Larvæ of *Eupithecia assimolata* were now numerous on wild hop, also a few small *P. chrysitis*. I tried sugar in lanes and marshes, and obtained several *A. pistacina*, *A. lunosa*, *A. litura*, *Calocampa exoleta*, also seven *Calamia lutosa* at rest on reeds, but the rain drove me home.

The 25th was fine, bright, and warmer. A good many *Pararge megæra*, *C. phleas*, and *L. icarus* were still about. The two latter were most abundant this autumn. I went to the woods in the evening. A good many moths visited my sugar—*A. rufina*, fine and very fresh, *A. pistacina*, *A. lunosa*, *L. pallens*, *X. cerago*, *T. orbona*, *A. suffusa*, &c.

The 27th was a warm dark night, with moderate westerly wind. I sugared in lanes and marshes. Moths were rather plentiful. *C. lutosa* were swaying to and fro on the reed-blossom in some numbers, but were mostly worn. On the sugar, in addition to plenty of *A. pistacina*, *A. puta*, &c., were four worn *C. nupta*, and one each of *B. rhomboidaria* and *H. proboscidalis*. It was rather late in the year for these.

(To be continued.)

THE SECOND INTERNATIONAL CONGRESS OF ENTOMOLOGY, OXFORD, AUGUST, 1912.*

By H. ROWLAND-BROWN, M.A., F.E.S.

THE Second International Congress of Entomology follows the inaugural Congress held two years since at Brussels. In the ordinary course of events, it was intended to make the reunion triennial. In 1910, however, it was expected that the British Association would proceed to Australia in 1913, and as many entomologists had announced their intention of going with them, it was decided to anticipate events. Yet, although no more than two years have passed since the last meeting, the attendance at Oxford is striking proof of the keen interest taken by scientists in entomology, though the actual number of members subscribing is lower than it was on the previous occasion.

Not far short of two hundred took part in the session, which lasted from Monday, August 5th, to Friday, the 9th, for the list published at the beginning of the week was supplemented by many who found it convenient to attend only on certain days. It is, however, a matter for regret that the British Field Natural-

* A part of this notice appeared in the 'Times' of Monday, August 12th, under the heading "Congress of Entomology—a Retrospect."—H. R.-B.

ist Societies did not take up the Congress with more zest; and there were absent quite a number of ardent workers who would have been a welcome addition to the forces. On the other hand, the international element was well sustained; the United States leading the way with eighteen members, Germany following with thirteen, Belgium with nine, while I think the only European States of the west and north unrepresented were Italy, Portugal, Russia, and Norway. Against this it is gratifying to note that the remoter countries—Turkey (2), Spain (4), and Egypt (1)—all sent delegates, and Dr. R. C. L. Perkins, of the Sandwich Islands, and Professor Carlos E. Porter, of Chile, may be congratulated on having come from “the uttermost parts of the earth.”

Proceedings opened in the beautiful hall of New College on Sunday evening (4th) with an informal gathering to meet the President, Professor E. B. Poulton, F.R.S., and then the charming badges designed by Professor Selwyn Image, Slade Professor of Art, were distributed to members, and the various orders of the day circulated. The badge consisted of a circular gilt brooch, with the arms of the University, our hosts, in blue enamel, and the legend “Congr: Entomol: Internat: Oxon: 1912.” This served as a pass throughout the week to all the meetings and festivities. And here I may be permitted to offer a word of grateful thanks to those who were responsible for the organization of the Congress, the indefatigable Secretaries, Mr. H. Eltringham (whose exhibition of Acreines was one of the *clous* of the Museum*) and Mr. G. H. Grosvenor, who stepped into the breach when Dr. Malcolm Burr was unavoidably prevented from completing his work, and attending the first days; Professor Poulton and Dr. F. A. Dixey, who invented the delightful *café* in the gardens of Wadham College—where members lunched, teaced, and met after dinner under shelter of Mr. Moon’s large marquee—and made the arrangements for the final banquet when the Christ Church rendezvous was perforce abandoned. A hundred and forty members and guests were present in Wadham College Hall on this occasion—the college which is actually the cradle of the Royal Society, where the original F.R.S. assembled under Warden Wilkins (1648–59),† and where for the first time in history a lady replied to the toast of “The Ladies.” Meanwhile, the great majority of members were housed for the week in the several colleges of Wadham, New, Merton, and Magdalen, and our foreign friends were thus initiated into the mysteries of

* A grand collection of Acreinæ, models for the figures of Mr. Eltringham’s “Monograph of the African Species of the Genus *Achreæa*, Fab., with a supplement on those of the Oriental Region,” Trans. Ent. Soc. Lond., Part 1, July 12th, 1912. Dr. Dixey also exhibited an equally comprehensive series of Pierinæ.

† See ‘The Early Connexion of the Royal Society with Wadham College and the University of Oxford,’ by F. A. D. Oxford, 1912.

the Oxford breakfast and "bedder," and given an opportunity to inspect the matchless silver treasured within these ancient "homes of peace." Among eminent lepidopterists may be mentioned M. Charles Oberthür, of Rennes, paying a first visit to England, and Professor D. A. Seitz, of Darmstadt; of other branches, Dr. A. Handlirsch (Vienna), Professor A. Lameere (Brussels), President in 1910, Dr. E. Olivier (Moulins), Professor H. J. Kolbe (Berlin), Professor Dr. J. F. Van Bemmelen (Groningen), Dr. G. Horvath (Budapest), Father Lunginos Navas (Barcelona), Professor Y. Sjöstedt (Stockholm), of Kilimanjaro fame; and a fully representative body of workers from America, including Professor J. H. Comstock (Ithaca), Dr. L. O. Howard (Washington), Professor V. L. Kellogg (Stanford University), Dr. H. Skinner (Philadelphia), and Professor W. M. Wheeler (Harvard); economic entomology in the Canadian Commonwealth being safe in the hands of Dr. C. Gordon Hewitt (Ottawa) and Mr. H. H. Lyman (Montreal).

PRESIDENTIAL ADDRESS.

The Presidential Address was delivered on Monday morning, Professor Poulton laying special stress on the claim of the Oxford University Museum as a place of meeting. For it was under this same roof that the early struggles between the "Darwinians" and the older schools of thought took place; that Ruskin preached the doctrines of natural beauty; and that from early beginnings in 1849 the Hope Department under Westwood took form and shape as leader and teacher in the world of entomological discovery and thought.

By means of numerous examples he then traced the evolution of the female butterfly *Papilio dardanus* from Madagascar across the continent of Africa. In the island the female closely approaches the male in the coloration and markings of the wings. But on the continent at the Rift Valley escarpment, British East Africa, and in its westward localities it assumes a variety of forms corresponding with the several distasteful species of other genera found or known to exist in these localities. Thus on the north-east and north-west Nyanza the males are still unchanged in appearance, yet the female butterfly exhibits wings of several patterns. But while the males retain their ancestral coloration, the females mimic various Danaine species. In Nigeria the female occurs principally in a black and white form (= *hippocoon*), mimicking the dominant black and white Danaine of that region. Eastward again from the Rift Valley escarpment, from Mombasa into German East Africa, the usual models are of the Danaine group, though one form of the female (= *planimoides*) has developed the pattern of a member of the Acraeinae genus *Planema*, and in South-east Rhodesia the black

and white (*hippocoon*) form predominates, and the butterfly is found to fly together with the black and white species of other groups. At Durban three forms of the female (*hippocoon*, *trophonius*, and *cenia*) occur, and all of them have been bred from eggs laid by the same parent, together with a fourth form (*leighi*), named after the discoverer, the late Mr. Leigh.

Other papers upon evolution, bionomics, and mimicry, and bearing on the subject of evolutionary processes as observed in insects were contributed by the President, who gave an account of Mr. C. A. Wiggin's and Dr. G. H. Carpenter's researches in mimicry in the forest butterflies of Uganda; by the Rev. K. St. A. Rogers; and by Mr. R. C. L. Perkins, who described and compared the colour-groups of Hawaiian *Odynerus* (wasps) found on the two neighbouring islands, Oahu and Kauai. In the section of philosophic entomology Professor J. F. Van Bemmelen (Netherlands) explained the phylogenetic significance of the development of the butterfly wing, illustrating the development of the colour pattern in the pupal and imaginal phases, and showing how by the ancestral pattern, traced in this way, species widely differing in appearance may be identified and classified as members of the same family.

DISTRIBUTION.

Several important papers were read on the subject of insect distribution, and the assistance rendered to science, especially to palæontology, by a closer knowledge of the subject. Professor Kolbe explained "Die Differenzierung der zoogeographischen Elemente der Kontinente," showing how the elements of the existing insect fauna of Europe consist of circumpolar groups, relics of ancient geological periods, and lately arrived groups from Western and Central Asia and the tropics: the same process being observable in North America, where, as in the Old World also, over the southern continents are to be found elements of the northern, of the tropical zone and of the antarctic continents. Dr. Handlirsch dwelt on the relations between palæontology, phylogeny, and "animal geography," and attempted the solution of several interesting problems by statistical methods, demonstrating thereby that many of the hypothetical "land bridges" lately constructed between Africa, America, and Australia will not stand scientific criticism on these lines. While Dr. P. Speiser insisted on the importance of determining how far their presence might be due to human agency in fixing the antiquity of species in a given locality.

ECONOMIC AND PATHOLOGICAL.

In none of the Sections was greater interest shown than in the Economic and Pathological, where methods of combating

insects destructive to agriculture and forest were dealt with by many delegates appointed by our Colonial and by foreign Governments. The paper read by Sir Daniel Morris on behalf of Mr. W. A. Ballou (Imperial Department of Agriculture), "Some Entomological Problems in the West Indies," demonstrates beyond dispute how an intimate knowledge of the life-histories of insects may be put to practical uses, and how by the introduction of the natural parasite of an immigrant pest the attacks of the pest may be controlled and even defeated altogether. For example, in the sugar-canes of Barbados a root-boring weevil, *Diaprepes abbreviatus*, has become a pest; in St. Kitts termites, *Termes flavipes*, have attacked the ripening stalk; in Barbados the red maggot, *Perrycondyla gossypii*, in Antigua the flower-bud maggot, *Contarinia gossypii*, and in all the cotton islands except Barbados the leaf-blister mite, *Eriophyes gossypii*, have done great injury to the growing plants, but by the destruction of old plants at the end of the season, and picking off and destroying infested leaves, a satisfactory crop has been ensured. Yet the control of some of these pests by their natural enemies has proved even more effective. In Barbados black-scale, which wrought widespread havoc, is now completely controlled thereby. By the use of the shield-scale fungus the scale insects, which are accompanied by the black blight, have been much reduced. In St. Vincent the cotton worm, *Alabama argillacea*, has been subjected successfully to several predacious insects, especially the "Jack Spaniard," *Polistes annularis*.

The question of international action to check generally the importation of pests was raised in the discussion of Mr. A. G. L. Rogers's paper on "The Necessary Investigation with relation to Insect and Fungus Enemies of Plants, Preliminary to Legislation." Mr. Rogers pleaded for the consideration and establishment of principles upon which such action might be made feasible. So far, he said, regulations of the kind, while hampering international trade, had in no case been successful in preventing the introduction of disease, the truth being that the pest had anticipated the law. But the real cause of the failure is due to ignorance of the conditions under which the pests spread rapidly enough to become a serious danger, and of their distribution throughout the world; experience proving it impossible to foretell which species will fail to establish themselves, and *vice versa*. Thus, although the potato moth is harmless in Italy, it became a pest when introduced into India; while several Continental pests have failed to establish themselves in England. A close study of the pest in the mass, and of the aggregate injury caused by a congregation of destructive insects in their *maximum* intensity, would prove the most useful, and each country should be invited to compile a black list of those present in sufficient numbers to be characterized as

epidemic; to prepare maps of areas infected, and to communicate these, with the records, to all Governments interested. Mr. Rogers's practical suggestions were accepted and endorsed by the Congress, which at a later stage unanimously resolved to support cordially the proposed formation by the International Institute of Agriculture at Rome of an International Commission to deal with these problems, as the best means to secure the greatest amount of protection with the least injury to international trade in natural products.

As a further practical demonstration of the place of biometrics—the study of life-history—in economic entomology, a paper on “Aphides Attacking Cultivated Peas” may be mentioned. Professor F. V. Theobald declares that he has failed to find in this country a single instance of pest control by natural enemies, and regards birds as our most valuable allies, even the much-abused sparrow coming in for special tribute as a greedy consumer of green-fly, in company with such insectivorous species as the whitethroats and smaller tits. He had discovered, however, that the suspected pea-pests of the genus *Macrosiphum* contained more species than was supposed, some of which were harmless to the plants in question, while a study of the life-history of the destructive green-pea aphid revealed the fact that its earlier phases are passed upon clover. In Canada this aphid is also very injurious, but, as Dr. Gordon Hewitt pointed out, the conditions there appear to be different, and it is usually controlled by a small Braconid parasite. On the subject of locust destruction, Mr. J. Jablonowski (Budapest) presented an extremely instructive series of lantern-slide pictures to illustrate the methods employed by the Hungarian Government to combat the ravages of the species known as *Stauronotus maroccanus*, showing the systematic division of infected areas within canvas screens, the way in which the insects were driven towards them, and how, when they attempted to surmount the fences, they were destroyed and burned. He said that by means of the apparatus employed the total cost of the operations had been reduced from something approaching three million krone to about 270,000 krone, contrasting more than favourably with that incurred by the British Government in Cyprus under similar conditions.

In the pathological department Dr. Stephen A. Forbes (U.S.A.) contributed a valuable series of observations on “*Simulium* and Pellagra in Illinois, U.S.A.” We are accustomed to associate this terrible human scourge in Europe with rural Italy, and hitherto the transmission of the disease germs has been attributed to the agency of a species of sand-fly, breeding in streams and running water, but never, like the mosquito, in stagnant pools. Dr. Forbes, however, has failed to associate directly the many cases of pellagra investigated in his State

with insects of this genus, and at present, therefore, the case against *Simulium* must be regarded as not "proven."

NOMENCLATURE.

In the present state of chaos and conflicting opinions upon the subject of nomenclature it is gratifying to note that the Congress has indicated a system and rules which may lead to finality. All entomologists are agreed that the time is ripe for action. The difficulty hitherto has been the adoption of methods calculated to bring about the desired end. Those who heard M. Charles Oberthür's eloquent appeal, "Pas de bonne figure à l'appui d'une description, pas de nom valable," cannot fail to have been struck at once by the sincerity of the speaker and the splendour of his ideas. But British entomologists cannot accept the proposition, even when M. Oberthür is prepared to concede a photograph instead of a coloured figure, and though, in parliamentary phrase, the motion was not pressed to a division, the feeling of the Congress was obviously in favour of "words" as opposed to "pictures," and the arguments brought forward in Mr. L. B. Prout's paper "On the Place of Figures in Descriptive Entomology." In the end, therefore, the resolutions sent up by the Entomological Society of London were adopted in principle, and it was decided to institute an International Committee to deal with the subject of entomological nomenclature. The Congress also advised the formation of national committees in each country, to be elected by the various entomological societies, to collect opinions and consider changes required in the International Code; and further commissioned the International Committee to communicate their resolutions to the International Committee on Zoological Nomenclature.

OTHER PAPERS.

I regret that in the space at my disposal I can do no more than mention the titles of some of the other papers read. They include the fascinating study by Professor J. H. Comstock, "The Silk of Spiders, and its Uses"; "Scent Organs in the Lepidoptera," Dr. F. A. Dixey, M.D., F.R.S.; "Sex Limited Inheritance in Insects," Professor L. Doncaster; "On the Viviparity of Polycetenidæ," Dr. K. Jordan; "On the Founding of Colonies by Ants," Mr. H. St. J. Donisthorpe and Mr. W. C. Crawley; "How does the Insect See the World?" Dr. Adalbert Seitz; Professor Kellogg's suggestive researches on "Distribution and Species-forming among Ectoparasites"; and Mr. S. A. Neave's vivid *résumé* of his "Travels as an Entomologist in Eastern Africa."

NATIONAL RESERVES.

Nor must I omit to mention, among the less technical subjects brought before the Congress, that none met with a more sympathetic reception than the Hon. N. C. Rothschild's plea for the institution of National Reserves throughout the United Kingdom in suitable localities, wherein the insect fauna and flora of these islands may be preserved for the common enjoyment of the student and the general public. A "Society for the Promotion of National Reserves" has been formed, and will presently publish its "prospectus." In the United States vast territories have been allowed to remain in a state of primitive nature; in Sweden, latterly, the Government has "enclosed" certain threatened areas of Lapland; and in Hungary official permits are required of collectors in favourite localities. Years ago Oxford led the way with the "Ruskin Plot," while a portion of Wicken Fen has already been reserved to the nation for ever.

SOCIAL.

Lastly, despite the rain of surely the wettest August on record, the excursions arranged for Wednesday afternoon were both extremely successful, large parties enjoying the welcome accorded them by the Secretary of State for the Colonies, Mr. L. Vernon Harcourt, M.P., in his lovely Nuneham House; and the picnic in Bagley Wood, at the invitation of the President and Fellows of St. John's College; while we shall not soon forget the concluding entertainment of the entire Congress at luncheon, and in the Museum at Tring, by the Hon. Walter Rothschild, F.R.S., to whose support, coupled with that of the "Carnot" of our organization, Dr. K. Jordan, we owe it largely that the International Congress of Entomology is established and permanent. Meanwhile, the next meeting is fixed to take place at Vienna in 1915, under the presidency of Dr. A. Handlirsch.

BY THE WAY.

WESTWOOD is, and will ever be, a name to conjure with among us, for never again can an individual possess so complete a grasp of the whole gamut of entomological lore. He was "a man of culture and intelligence and a distinguished entomologist," as says the current 'Strand Magazine'; yet "he never succeeded in pronouncing the letter 'h.'" He once asked his friend Mansel who was St. Bee? Remembering his peculiarity, Mansel replied that he was a near kinsman of St. 'Ives. At an electoral contest between Mr. Gladstone and Mr. Hardy, Westwood, coming in late, hurried and breathless, announced his vote for "Glad—no, no—I mean 'Ardy." Henry Smith claimed

the vote for Gladstone. "Why," said the Vice-Chancellor, "he only pronounced the first syllable of Mr. Gladstone's name." "Yes, sir; but he did not pronounce the first letter of Mr. Hardy's." The same Magazine has an interesting article on "The Lore and Legend of Japanese Fire-Flies," and their "Hunting Song":—

"Hotaru koi, Hotaru koi,
Ando no hikari wo choito mite koi."

reminds one of our "Lady-bird, Lady-bird, fly away home." These naturally become Golden-bugs in the land of the almighty dollar.

A newspaper notice just the other day informed all and sundry that "The State of California has recently discovered the great value of the ladybird as a destroyer of the plant-lice that kill the fruit buds": William Kirby discovered the same thing—about 1820. The State wanted quantities, and their collectors could find "cast-off shells" (presumably of pupæ) only. But, on returning to the shells in the winter, they came across "a peculiar snowball, with a nucleus of twigs and pine-needles. The ball was broken open, and inside was found a squirming mass of ladybirds. Four hundred pounds of ladybirds were dug up in one day from under the snow and sent to Sacramento." Whether the ball was made by *Coccinellæ* or *Aphides* is not stated, but we should suspect the former to have rather devoured the latter than that they themselves be a gall-making species, and to have a penchant for a common prey rather than true gregariousness.

Lincolnshire is an extremely neglected county entomologically, and we have never met anyone who had collected aught but *Lepidoptera* there. So we took a rush through it last June to see its possibilities. Approaching from the south we slept at Spalding and Boston, both considerable towns in the lap of very thoroughly drained fens; these fens stretch through the eastern half of the county, and have been cultivated so long that we failed to find in them a single fen, or uncommon, insect; to the north-east Boston has some common agricultural country. The fens dogged us through Wainfleet to Skegness, a modern seaside resort with nothing to appeal to us but the sandhills and a little heathy ground extending some five miles south, covered with *Hippophae rhamnoides*, with its peculiar *Psylla*; the sand here is very pale, and the *Diptera* frequenting it decidedly paler than the same species are at Deal. At Mablethorpe we met the same sand, though the height of the Roman sea-wall sheltered additional insects. Two nights we stayed at Louth, a delightful old-world town surrounded by charming country, of which the

Elkington Woods afforded capital collecting. Thence a run to see the Grimsby shipping was hurriedly followed by a *volte-face* to Market Rasen, a small market-town with the usual midland complement of wood and lane collecting: the day was fine and insects abundant. At Lincoln it poured torrentially. But we thought eighteen hundred specimens not a bad week's bag, though many were common kinds.

C. M.

NOTES AND OBSERVATIONS.

NOTE ON STEPHENS'S CULICIDÆ.—Since writing my notes on the British mosquitos I have been surprised to discover that Stephens's collection of Culicidæ is not only still in existence, but the specimens are still in a fair state of preservation in the British Museum. Of the species Stephens described himself, *C. affinis* is represented by six male *Theobaldia annulata*; *C. fumipennis* by one female *Theobaldia theobaldi*; *C. marginalis* by one male and one female *C. pipiens*; and *C. concinnus* by one female *O. nemorosus* (?). The dark margins of the abdominal segments referred to by Stephens in *C. marginalis* are the posterior borders, not the lateral ones, as might be inferred from the description; the colour is on the integument and is not due to scales: such a condition occurs not uncommonly in female *C. pipiens*, but there are no structural differences. The specimen of *C. concinnus* was not so labelled, but answers perfectly to Stephens's figure; it is just possible it may eventually prove distinct from *O. nemorosus*, but I prefer at present to leave it as a synonym or variety of Meigen's species. The name *Theobaldia fumipennis* (Steph.) will have to replace *T. theobaldi* (Meij.). Of the remaining specimens in the collection, those named *sylvaticus*, *lutescens*, *punctatus*, *rufus*, and *bicolor* are all more or less rubbed *C. pipiens*. *C. ornatus* is represented by one female *O. lateralis* and one male *O. diversus*; *C. flavirostris* by one female *C. pipiens* and one male *A. maculipennis*.—F. W. EDWARDS; British Museum (Natural History).

EGG OF EUSTROMA RETICULATA.—Having recently had an opportunity of observing the ova of *Eustroma reticulata* deposited under natural conditions, a brief description of the egg may be of interest to complete my previous notes on the life-history of this species (*vide* 'Entomologist,' March, 1912, p. 85). Size, large for the size of the moth; shape, a blunt oval; colour, pearly white, decidedly opalescent; surface, smooth, and, under moderate magnification, without "pitting" or pattern; attached to the under side of the balsam-leaf in apparently no precise situation; rarely more than one egg on a leaf.—FRANK LITTLEWOOD; 10, Aynam Road, Kendal, Westmorland, August 7th, 1912.

ARGYNNIS EUPHROSYNÉ, ab.—A short time since my friend Mr. C. J. Bellamy showed me a variety of the above-named butterfly he had been fortunate in capturing in the Now Forest this season. The usual tawny-brown ground colour of the wings is replaced by a pale

creamy tint, which gives the specimen a semi-transparent appearance, and consequently the usual black spots and bars—which appear to be normal—show up conspicuously, and the dark blotches at the base of the wings are very obvious. At the anal angle of hind wings there is a shaded indication of the usual tawny hue. The specimen is apparently a male in very fair condition, although I should imagine when seen on the wing it might have been mistaken for a very worn specimen.—G. B. CORBIN; Ringwood.

COLIAS EDUSA, *PYRAMEIS CARDUI*, AND *P. ATALANTA* IN THE ISLE OF WIGHT.—The weather of late has been most unfavourable with us for entomology. The early part of the season was good for *C. edusa*, *P. cardui*, and *P. atalanta*. I bred the two former from ova, and of the latter larvæ were found in plenty on nettle. I took females of *P. cardui* in March which deposited ova, from which fine specimens were reared in May and June. I obtained ova of *C. edusa* in May, and had a very fine series from these. I now have another family of *C. edusa* feeding up in my greenhouse. I am afraid that this species has fared badly in the open, as we have had ground frost and continuous rains.—G. NOBBS; North Lodge, East Cowes, Isle of Wight, August 17th, 1912.

COLIAS EDUSA IN WILTSHIRE.—A fine male specimen of this butterfly was captured near Fordingbridge on August 5th, 1912.—A. S. CORBET; Bournemouth.

CAPTURE OF *PONTIA DAPLIDICE* IN NORFOLK. — On Wednesday morning, July 17th, I captured a specimen of *Pontia daplidice* near Norwich; it was a female, and in good condition. The 17th was warm and sunny, with rather a strong north-easterly wind, which had been blowing, more or less, for the two previous days, and common butterflies were plentiful on the sheltered flowery railway-bank, along which I happened to be walking, luckily, however, with a net. The *daplidice* was amongst a good many *Pieris rapæ*, flying very sluggishly and feebly from flower to flower, eventually settling on a plant of knapweed, from which I caught it. A month previously I had been watching the strong swiftly-flying *daplidice* in Hungary, but the climate of Hungary is not that of Norfolk, and doubtless this specimen was more or less torpid and chilled by the cold of the early morning. I am glad to say that this record is an addition to the Norfolk list of butterflies, as *P. daplidice* has not previously been taken in the county, though it is reported to have been captured at Felixstowe and near Aldeburgh, in Suffolk.—GERARD H. GURNEY; Keswick Hall, Norwich.

PHRYXUS (DEILEPHILA) LIVORNICA. — A specimen of *Phryxus livornica* was taken at dusk at rhododendrons in a garden at Parkstone, Dorset, on May 19th last.—CYRIL ADAMS; Penn Hall, Parkstone.

DEILEPHILA GALII IN INVERNESS-SHIRE.—I took a very large and beautiful female example of this species at dusk here on the 24th instant, as it was hovering before some honeysuckle.—GERVASE F. MATHEW; Gairloch, Spean Bridge, N.B., July 29th, 1912.

LITHOSIA LUTARELLA (PYGMEOLA) AND CRAMBUS FASCELINELLUS IN NORFOLK.—When collecting on the Norfolk coast with the Rev. J. E. Tarbat, I noticed a small moth fall from a spike of marram grass on to the sand. My surprise and delight were great when on boxing the insect I found it to be a fine male *lutarella*. A subsequent visit at night to the same spot showed that the moth was there in some plenty, over a score of specimens being taken. A new locality for this local little moth seems worth recording, as hitherto it has, I believe, only been taken at Deal. In the same district we also took a fine series of *Crambus fascelinellus*. The capture of the first example was rather by way of a lucky chance, as it was disturbed from an overhanging sand-hill, which we subsequently found was not its usual haunt in the day-time. Later we discovered that the moth sits by day in the small sand-pits and cart-tracks on the more settled parts at the back of the sand-hills. By sweeping the net over the sand the insect could be induced to fly if the sun was shining. Each rose to settle again a few yards off, where it was easily captured. A few were taken on the wing at night, but nearly the whole of a long series was taken in the above manner.—JOHN W. METCALFE; Ottery St. Mary, August, 1912.

DIPTERYGIA SCABRIUSCULA IN HYDE PARK.—I caught in Hyde Park, on July 25th, an example of *Dipterygia scabriuscula*. Is this species of regular occurrence in London?—N. C. ROTHSCHILD; Arundel House, Kensington Palace Gardens, W.

METROCAMPA MARGARITARIA AND THYATIRA BATIS IN ISLE OF SKYE.—In your 'Moths of the British Isles' (ser. ii. p. 270) you except the Hebrides from the distribution of the light emerald (*Metrocampa margaritaria*). Perhaps it may interest you and your readers to know that this moth has been exceedingly plentiful this year (I cannot speak for earlier ones) at Kyleakin, Isle of Skye. It is true we are here very near the mainland of Ross-shire, or perhaps your reservation refers only to the Outer Hebrides.* I have also lately captured three fine specimens of *Thyatira batis* at sugar in a small wood round the house.—(Rev.) ARTHUR S. HOOLE; Kyle House, Kyleakin, Isle of Skye, July 25th, 1912.

COLLECTING IN WESTMORLAND, 1911.—*Argynnis adippe* seemed to be just beginning on July 23rd, although one of the three specimens caught had evidently been flying for some days. Males of *Epinephele anira* were plentiful, and three females were noted. Reed flowers, on the 6th, on some low-lying marshy ground, produced *Leucania impura*, *Plusia festuæ*, *P. arenosa*, *Coremia minutata*, and *Ctenocalpe vittata*. On the 9th, a very hot day, *Aphantopus hyperanthus* was present in limited numbers in its restricted haunt. Several var. *arete* and one good example of var. *obsoleta* were taken. Dusking on the 13th yielded *Lygris populata*, *Cidaria pyraliata*, *C. fulvata*, *Acidalia aversata*, *A. bisetata*, and *P. flavofasciata*. *Ortholitha limitata* appeared on the

* Yes, the outer group of isles was intended. *M. margaritaria* has been previously recorded from the Isle of Skye.—R. S.

16th, together with second brood examples of *P. napi* and *Chiasmia clathrata*. A female *Geometra papilionaria* netted at 10 p.m. on the 18th gave me thirty-nine eggs, four of them laid on the under side of a birch leaf, the remainder on the muslin cover of the flower-pot in which she was confined. A visit to the "moss" on the 23rd found *C. imbutata* (male) common, and with neither sun nor wind, easy to net. Rain came on, but still they "lifted" freely; the reverse being the case with *Selidosoma ericetaria*, which seems to like the sunshine, and is sluggish and difficult to move in dull weather. *L. ægon* was common, but looking *passé*. Some of the females are nicely splashed with blue.

On the 30th some twenty newly emerged *P. brassicæ* were noted feeding on knapweed flowers on the roadside, and on the 31st *Cilix spinula* was netted freely in the neighbourhood of blackthorn, and about a dozen *Anartus plagiata* flying at dusk over a small patch of St. John's Wort. Eggs of the latter hatched on August 16th, and the larvæ fed as long as the leaves remained, and are now sitting motionless on the dead stems. The same night found imagines of *Stilbia anomala* plentiful, but rather the worse for wear, on isolated patches of ragwort growing amongst the loose stones of the bare limestone fell. The sexes were about equally common. Though by no means shy of the lamplight, this moth is a difficult one to box off the flower head. If the flower is, by one's clumsiness, jarred or shaken the males usually fly and may be netted, but the females either drop to the ground or dive into the flower head. We found it a good plan to gently touch the ragwort stem with the rim of the net, and catch them as they either flew or fell. It is a restless insect in the pillbox, and should be killed immediately. The species seemed to be peculiarly local; an equally attractive looking group of ragwort heads at the other side of the wall failed to yield a single specimen, and the same thing was noticed on succeeding nights. In addition, the ragwort produced *Agrotis lucerneæ*, *N. umbrosa*, *T. pronuba*, *A. oculea*, *G. obscurata*, *L. olivata*, *C. truncata*, *C. bilineata*, *C. unidentaria*, and a number of "pugs."

Heather bloom was not very productive, for during August the extreme heat of the summer day was followed frequently by a distinctly chilly night. The only captures were *Noctua xanthographa*, *N. castanea*, *A. agathina* (four), *N. glareosa*, *N. dahlæ* (one), *C. graminis*, *C. salidaginis* (three), numerous *C. testata*, and *O. filigrammaria* (three) (Sept. 1st).

Up to 9 a.m. on August 13th *Vanessa io* could be taken freely, feeding on the flowers of hemp agrimony, but after that hour they apparently found some other occupation. The same morning I netted a freshly emerged male *Gonepteryx rhamni*. This species, formerly considered one of our "common" butterflies, is getting scarcer each year. *Tapinostola fulva* was out in good time this season, four fresh males being taken on August 14th. Mr. Mallinson reported *Chareas graminis* and *Epineuronia popularis* abundant at the Windermere lamps, accompanied by second brood examples of *L. camelina*, *N. ziczac*, and *P. dictæoides*. Sugar, which had been unprofitable all the summer, now began to look more hopeful. Our first essay, on

September 4th, produced one *Amathes litura*, one *T. pronuba*, one *Amphipyra tragopogonis*, and one beautifully fresh *E. nigra*—a sample lot, but enlivened by the presence of the last-named species. A second attempt on the 6th added another *E. nigra*, one fresh *M. brassicae* (second brood), and one *A. ypsilon*. Subsequent systematic sugaring throughout the month was rewarded by the capture of a fine series of *E. nigra* in bred condition; about a dozen *A. ypsilon*, an abundance of *A. aprilina*, *E. satellitia*, *A. litura*, *A. helvola*, *C. lignea*, *C. vaccinii*, *A. circellaris*, *A. macilenta*, *M. oxyacanthæ*, and var. *capucina* (some very dark); a few *H. protea*, *A. lota*, *C. quadripunctata*; three *A. segetum*, one *A. exclamationsis*, one *P. chi*, one *N. c-nigrum*, and one *H. nictitans*. Two specimens of *C. vetusta*, and about a dozen *C. exoleta* were added in early October. *Agriopsis aprilina* varies considerably in the distribution of the black on the fore wings—some are very dark and striking. An interesting peculiarity of this species appears in the extreme and permanent rigidity of the joints of the fore legs after death (pricked with oxalic acid), making it a matter of considerable difficulty to extend and set these limbs. The muscular development of the femora is abnormal, but I have looked in vain for the reason. Other insects killed in the same way were not affected. Among hundreds of *Conistra vaccinii* I was lucky to find two good examples of the var. *suffusa* (Tutt), a form I do not remember noticing before. Autumnal sugaring presents some difficulties, the chief being (perhaps) the necessity of completing one's round well before dusk. All the moths come in the first hour or so, and after that may be looked for, not on the patches, but round the back of the tree and higher up on the branches. We frequently saw them later in the night as high as 12 ft. from the ground.

The conditions that go to make a good night are still a mystery; a bright moon and cold north wind were not invariably found to be detrimental to success, but the slightest touch of frost in the air was fatal, and put an end to the flight. At this time of year, however, it is possible to work in a couple of rounds and make a respectable catch in the early part of the night before the frost air is felt. Moths seem to anticipate an approaching storm, and an apparently ideal night, precursory to a change in the weather, will prove unproductive. The entomologist is not the only one to take toll of the visitors to "sugar." Night after night bats could be seen circling the baited trees, and several toads were observed actually standing on their hind legs beneath the patches with an air of blissful expectancy that was truly ludicrous. *O. dilutata* appeared on October 3rd, and was flying commonly by the 16th, when several nice melanic females were taken.—FRANK LITTLEWOOD; 10, Aynam Road, Kendal.

BUTTERFLY COLLECTING IN SICILY AND CALABRIA IN 1911.—The first week in May was very disappointing. My records are: May 1st (Labour festa) dull and showery, with occasional slight glimpses of rain; the following day (May 2nd) began: "morning bright and sunny, spring butterflies out, fine fresh specimens including *cyllarus* and *rubi*," and ended, "wet afternoon and evening." The

rest of the week was dull and cloudy, interspersed with showers and heavy rain.

The second week in May proved little better; I decided to make a tour to Southern Sicily, and took train to Licata, the port famous for the export of sulphur, which faces Africa. I had visions of African "migrants." The further south I got the country became more barren, more rocky, and more uninviting. Licata is a non-sanitary, dirty town, and especially dispiriting when a drizzling rain persists in falling. Next day I decided to proceed, or rather to return home, by a different route, and took the train. Here the people are so poor that the trains run at half the fares charged north of Syracuse and on the mainland, so travelling is cheap, and it is unnecessary to add slow, as the gradients are very steep. I booked to Ragusa, a town of 20,000 inhabitants, and the line runs through a rocky, treeless district, where miles and miles of thick stone walls enclose small patches of rocky ground, and where a little vegetation struggles through, but I saw no cattle in the fields. Ragusa is built on each side of a torrent bed, and is surrounded by a rocky district where asphalt is obtained. I could find no decent place to sleep at, and was recommended to take the last train on to Modica, with 40,000 inhabitants, and where there is an hotel. On reaching there I had to walk from the station, as recent rains had washed away the bridge and part of the roadway and stopped the cabs. I was welcomed at the hotel in Sicilian fashion, and was given a room to myself large enough for a troop of soldiers, containing four beds quite lost in the four corners of the immense chamber. My bill was reasonable, and next morning I had the novel experience as I left of finding the whole of the hotel staff, including the landlady, assembled to say good-bye and wish me a pleasant journey. Fortunately, my stock of small coins sufficed to satisfy everybody, including the landlady. Some of the staff I had not even seen. From Modica, which much resembles Ragusa, and seemed much too rocky and barren for collecting purposes, I took the first train on to the coast and arrived at Pozzallo, the asphalt seaport, about ten o'clock in the forenoon. I had a pleasant walk, and the sun shone. I saw *edusa* in the olive gardens, and the humming-bird-hawk moth in numbers flying near the stone walls warmed by the sun; but the district is not fertile, though better than round Modica and Ragusa. In the afternoon clouds intervened, and I took train to Syracuse. On my journey, at a place called Avola, I found myself looking on a fertile district that I should like to revisit. At Syracuse I was of course dependent on the weather, which turned out unfavourable. I took a long walk towards Fort Euryalos (a good entomological locality), on my way looking into a famous *satomia* (stone quarry), very interesting to an archæologist, but as I saw no butterflies I took train to my old quarters on Mount Etna. I spent a day near Randazzo, mainly waiting for the clouds to break, which eventually they did for exactly an hour. I had then reached the locality where *Euchloë damone* and *Thais polyxena* occur, and these both appeared directly the sun shone, and also disappeared with the advent of clouds. I got nothing afterwards except larvæ of *Vanessa urticæ*, which was common. The

following morning (May 14th) Mount Etna was hidden by clouds, and I returned to Messina with a very poor opinion of "Sunny Sicily."

Again I braved the elements, and on May 14th went with my son to Reggio in Calabria by ferryboat for a day on the hills. It was an eye-opener to come into contact with poverty unequalled anywhere I have been; the men had not even a spare sou to spend on their favourite indulgence—tobacco—and the women slave at carrying heavy burdens for the merest pittance. We had forgotten our customary "tin of sardines," and could get no eggs even at the wine shop, only bread and wine, so did not stop long. The geological strata were most striking, and entomological possibilities great; but the day was sunless, and not a butterfly was seen. The records for the third week in May are chiefly "cloudy," and also include "scirocco" and "cold and boisterous." The month practically kept up its bad reputation to the end. True, on May 23rd, I visited Mount Etna, and stopped three nights. During short intervals of sun I captured sufficient specimens of *Euchloe damone* to complete my series, but I obtained no fresh species, and several that I had taken before were not in evidence. Excursions near Messina were also made without success, owing to lack of sunshine. My most fatiguing day was May 31st. I took train to Scaletta (twelve miles) at the foot of Monte Scuderi (4000 ft.). It was cloudy, but I had hopes the clouds would break, so I walked up in order to reach uncultivated ground where it is possible to wander about quite freely. I reached the part where only the goatherd and his flock are met with, noting on the way a possible "marble white" locality. The goatherd pointed out to me the only available natural fountain of drinking water, carefully protected by his class, and I was able to eat my lunch there comfortably. Then I was tempted to go to the top, a thankless task, for the top is bare rock, and increasing clouds shut out entirely the view. I decided to return quickly, but half way down I was enveloped in the cloud, and soon was unable to see my way. Only those who have been in a cloud know what it is like. I missed the track, got amongst long grass, and when the rain came I had to sit down and wait. In common with the vegetation I was soaked through. After a seemingly interminable walk I was very glad at the first wine shop to swallow hurriedly a glass of their "cheap and nasty" wine to gain a little Dutch courage to help me to the station.

The first week in June was a continuation of the May weather, but on the 5th I started a campaign to look for "marbled whites." I crossed the straits to Scylla, in Calabria, to search for *Melanargia arge*; I reached an apparently suitable locality, but met with no success. Possibly I was too early, the season being late, or the "scirocco" stopped its flight. My captures were *egea*, one; *doritis*, one; *mera*, a few; and others.—J. PLATT BARRETT; "Westcroft," South Road, Forest Hill, London, S.E.

(To be continued.)

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May 9th.*—A. E. Tonge, F.E.S., President, in the chair.—Mr. J. E. Gardner, of Upper Clapton, was elected a member.—Mr. Jäger exhibited, for Miss Edwards, a series of *Hybernia leucophaëaria* from East Grinstead, with which a large percentage of var. *marmorinaria* had occurred this year.—Mr. R. Adkin, specimens of *Dianthæcia luteago*, and read notes on the two varietal forms *barrettii* and *ficklini*.—Mr. R. Adkin then read a paper entitled “Labelling Entomological Specimens,” after which a considerable discussion took place.

June 27th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Sothorn Dekter, of Lee, was elected a member.—Mr. Gahan exhibited some sycamore leaves showing the mines of the larvæ of the sawfly *Phyllotoma aceris*, and the remarkable cases, in the form of little circular discs, constructed by the larvæ. These cases become detached and move on the ground by little hops, somewhat like the Mexican jumping bean.—Mr. A. Sich, specimens of the rare Micro-Lepidopteron *Coleophora agramella*, from Hailsham.—Mr. R. Adkin, a short series of *Biston hirtaria* bred from Aviemore larvæ, which fed up in 1908. The imagines exhibited emerged in March and April of this year.—Mr. Edwards, a pair of the beautiful Lycaenid *Eumæus debora*, from Mexico, and a fine specimen of the rare *Epiphele eriopsis*, from Bogota.—Mr. Cowham, a fine regular variety of *Abraxas grossulariata* taken in his garden; the usual yellow markings were almost absent, and the black markings were of smaller area and very symmetrical.—Mr. Dods, a cocoon of *Platysomia cecropia*, from which the imago had emerged by the wrong end.—Mr. Goff, somewhat heavily marked specimens of *Brenthis euphrosyne* from Kent and Surrey.—Mr. H. Moore, a huge tick taken from a tortoise from North Africa.—Mr. Stop read the Report of the Delegates to the Congress of the South-Eastern Union of Scientific Societies held at Folkestone in June.—HY. J. TURNER (*Hon. Rep. Sec.*).

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—*March 6th.*—Mr. J. H. Watson exhibited a drawer of the varieties of *Parnassius mnemosyne*, notably vars. *haltares*, *hartmanni*, and *melaina*. He also showed a larva of the hybrid between *Cricula andrei* and *C. trifenestrata*.—Mr. A. E. Salmon showed examples of West African insects found in a Manchester rubber-works.—Mr. A. W. Boyd showed *Colias edusa* taken in Cheshire in 1912, a blue female *Lycæna icarus* from Killarney, and a blotched *Boarmia gemmaria* from Altrincham, Cheshire.—Mr. H. S. Leigh read a paper on the “Life-history of the Leaf-Insect *Pulchriphyllium crurifolium* and Mantis *Spodromantis guttata*.” He gave the results of his valuable personal observations of the life-history and habits of these two insects.—A. W. BOYD, M.A., *Hon. Secretary*.

PRESIDENT OF THE SECOND INTERNATIONAL CONGRESS OF ENTOMOLOGY
OXFORD 1912

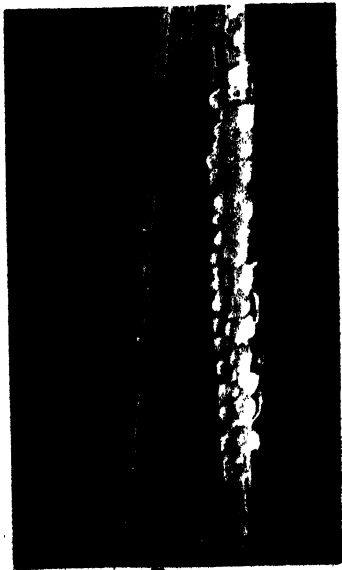


Edward Bagnall Poulton

EDWARD BAGNALL POULTON,

DSC MA TRS, FRS, LIC

Hope Professor of Zoology in the University of Oxford President of the Entomological
Society of London 1903-4 President of the Linnean Society 1912



APPENDAGES OF *TAPINOSTOLA CONCOLOR* ♀ AND *T. HELLMANNI* ♀ AND OVA.

THE ENTOMOLOGIST

VOL. XLV.]

OCTOBER, 1912.

[No. 593

NOTES ON THE LIFE-HISTORIES OF *TAPINOSTOLA CONCOLOR* AND *T. HELLMANNI*.

By H. M. EDELSTEN, F.E.S., & R. G. TODD, F.E.S.

(PLATE IX.)

MR. KERSHAW'S notes on the oviposition of *Tapinostola concolor* ('Entomologist,' xlv. p. 256) remind us of our promise to record the life-histories of these species ('Ent. Record,' Oct. 1910, vol. xxii. p. 240). We had been discussing the nomenclature of *T. concolor* with the late J. W. Tutt, but his lamentable death put a stop to our researches, and the notes got put on one side.

TAPINOSTOLA CONCOLOR.

Ova laid between July 3rd and 7th, 1909. Ovum round, $\frac{1}{2}$ mm. in diameter, of a shining dirty white colour, covered with a glutinous substance, no markings visible. The pressure of the sheathing-leaf slightly flattens the ova. Commenced to hatch July 20th, 1909.

Larva. July 25th.—Length $2\frac{1}{2}$ mm. Yellowish white, head rather large, and of a brownish yellow colour. Thoracic segments whitish. First five abdominal segments yellowish, rest whitish; anal plate blackish; body tapering from head downwards. A few small bristles from tubercles. Larva full-fed, May 16th, 1910.—Rather stumpy, swollen in the middle and tapering towards head and tail, but rather more towards the head. Head yellow-brown, shining and rather indented, and partly withdrawn into prothoracic segment. Plate on prothoracic segment shining ochreous; plate on anal segment also of same colour, and extending to thirteenth segment. Colour of larva creamy white with a slight pinkish tinge along the back. Spiracles black. True legs yellowish; prolegs white; hooks blackish. Tubercles with black bristles. Length 20 mm.

Pupa.— $12\frac{1}{2}$ mm. long, shining brown. Kremaster with two sharp bristles curved outwards, enclosed in a stout earthen cocoon.

Parasite.—*Cælinius gracilis*, Hal.

The eggs are laid in batches within the sheathing-leaf of the

flower-stem of *Calamagrostis epigeios*, and the larva enters the stem and feeds downwards, and hibernates towards the base of the stem. In the spring when the grass begins to shoot again, it feeds low down among the basal shoots. It enters several plants before it is full-fed. When about to pupate, it enters the earth and spins a strong cocoon.

TAPINOSTOLA HELLMANNI.

Ova laid August 8th-12th, 1909. Ovum round, $\frac{1}{2}$ mm. in diameter, colour creamy white, covered with a glutinous substance, no markings visible, except some very slight ribbings, but these were most likely caused by the pressure of the grass-stem. Commenced to hatch August 18th, 1909.

Larva.—Length $2\frac{1}{2}$ mm., of a shining whitish colour; head rather large and of a light yellowish brown colour; prothoracic plate creamy; anal plate blackish; body covered with fine hair. Larva full-fed, June 15th, 1910.—Length about 20 mm., tapering from middle to head, rather less towards tail. Colour creamy white; head brown. Prothoracic plate ochreous; anal plate ochreous, except the front part of it, which is blackish, and it extends to thirteenth segment. True legs yellowish; prolegs creamy with black hooks; spiracles black. A few bristles from tubercles. A good many bristles on anal plate.

Pupa.—12 mm. long, shining yellow. Kremaster with two long straight spines, and two short hooks curved outwards, enclosed in a stout earthen cocoon.

The eggs are laid in batches within the sheathing-leaf of the flower-stem of *Calamagrostis lanceolata* and *C. epigeios*, and the larva enters the stem and feeds downwards, and hibernates towards the base of the stem. In the spring it feeds in several plants before it is full-fed. It leaves the plant when about to pupate, and spins a strong earthen cocoon.

The larvæ of *concolor* and *hellmanni* are so very much alike that it is difficult to tell them unless one has them side by side. They feed in identically the same way, and their habits are similar. They cause the leaves to turn yellowish and wither, but are hard to find, as there are all the old leaves about in the spring. The only way to find the larvæ is to seek for isolated plants, part the herbage right down to the root and see if there is any frass or a yellowish leaf. The larvæ are more often than not just below the surface of the ground, as *Calamagrostis* is a deep rooting plant. Buckler's figure of the larva of *fulva* (vol. 4, Noctuæ, pt. i. plate lx. fig. 4) gives an excellent idea of the shape of the larvæ of both *concolor* and *hellmanni*. *Concolor* is on the wing at the end of June and early July. *Hellmanni* appears in Wicken Fen about the first week in August, but in Huntingdonshire and Northamptonshire it appears at the same time as *concolor*. The Wicken specimens of *hellmanni* are

generally paler than the Hunts and Northants specimens, which are of a much deeper colour. The anal appendages of female *concolor* and *hellmanni* are admirably suited for prizing open the sheathing-leaves of *Calamagrostis* stems whilst the ovipositor is thrust within. The photographs show them flat out. In the living insect they are folded together and are just visible. We are indebted to Mr. Main and Mr. Tonge for the photographs, and to Rev. C. R. N. Burrows for the preparations.

EXPLANATION OF PLATE IX.

1. Appendages of *T. hellmanni*, female, $\times 50$. 2. Appendages of *T. concolor*, female, $\times 50$. 3. Ova of *T. hellmanni*, $\times 5$. 4. Ova of *T. concolor*, $\times 10$.

AS OTHERS SEE US.

THE following account of the Second International Congress of Entomology, published in the 'Berliner Tageblatt,' of August 24th last, is from the pen of one of the German members, Herr Fritz N. Wichgraf:—

The first international assemblage of entomologists which took place in Brussels two years ago has been followed by a Second Congress in Oxford.

It was a most happy thought to welcome the solitary members to certain of the colleges, of which there are twenty-five in the town; whilst the married couples found the friendliest hospitality in the houses of the University Professors. I had the good fortune to be quartered in Wadham College, close to the Museum which was the scene of our activity, and nothing more charming could be imagined than my bedroom and sitting-room, with its panelled ceilings of old oak and every modern comfort in its tasteful furniture. The great bay-window in front, with its broad window-seat, looked on to the broad lawn of the cloister-courtyard, I might almost say; whilst another commanded a glimpse of the green trees of the garden. No motors, no electric tram. What an ideal spot for study!

We can scarcely have a conception of these gardens, or rather parks, of the colleges. Each might be a corner of "Sans Souci," but with ancient trees of every species in an extraordinary state of healthy vitality, and a luxuriance of vegetation which seemed almost tropical. The box becomes a veritable tree, whilst an infinite variety of conifers, notably cedars and araucarias, flourish in profuse perfection. This is accounted for by the richness of the soil and the damp warmth of the climate, for we had heavy showers every day.

But for the opening festival the sun shone brightly, and at ten o'clock the crowd of members assembled full of mutual

interest. In all directions there was a cheerful Babel of greetings from those who had last met at Brussels, and as to the Englishmen, who were naturally in the majority, it seemed as if the freshness of their climate had affected the character of their fine heads and active figures, whether in white-haired age or the vigour of youth. In the large assembly-hall, full of ladies and gentlemen, Professor Poulton made a punctual appearance. The Curator of the Museum and President of the Congress has a white Bismarckian moustache, and thick conspicuous eyebrows standing out crescent-wise. Mounting the rostrum he spoke a few impressive words as to the importance of the Congress, and in a brief retrospect reviewed the history of the Hope Museum, and the untiring industry of his predecessors, displayed in its different sections. He called attention to the highly interesting special exhibits, which, indeed, bear brilliant witness to the lofty standard entomology maintains in England, the classic home of this science. They must, indeed, operate materially in spreading the knowledge of subjects connected with natural history.

After the Secretary had read the list of future proceedings, Professor Poulton took the materials in his hands for his striking demonstration concerning the group of *Papilio dardanus*, Brown, in Africa (a white "swallow-tail"). The female gives astounding proof of the power of mimicry of her species, for she appears in red, black, and yellow, and without a tail, in inexhaustible varieties, seeming to belong to groups remote from those of her male. In Madagascar alone she remains true to type. Is that to be pronounced the limit to its operation?

The next speaker was the younger son of Lord Rothschild (specialist in fleas), who solicited support for the institution of a society to be founded for the general establishment of Nature Reserves to check the damaging effect of ever-encroaching cultivation upon the insect-world struggling for life with an ever-increasing difficulty, often terminating in the extinction of an entire species.

It would be impossible to give a full report of the work of the next few days, or rather, it may be said, of the quintessence of years of tireless industry and patient research. Suffice it to say that no aspect of the marvellous secrets showing the incessant activity of Nature was neglected, whether from an economic, pathological, geographical, or systematic standpoint. And that evolution, bionomics, the theory of mimicry, morphology, and anatomy are not neglected, the guides of the Hope Museum, so ably competent for their tasks, gave ample testimony. Nomenclature is always a knotty point, and it was a satisfaction to me to find that hard German heads were ready for argument. The general debate gave a shining example of unanimity, and this unanimity bids fair to lead to definite results. It was all the

more pleasing because so many peoples and languages were represented. England was naturally in the majority, then North America, Germany, Belgium, France, Austria, Holland, Spain, Sweden, Switzerland, Luxembourg, Egypt, Chile, Canada, the Sandwich Islands, British East Africa, and Borneo.

By a vote of the General Committee at the end of the Congress, a Central Commission was established in all the leading countries, in connection with local societies, to unite them, and to supply, if possible, definite answers to all entomological questions by recognized authority. This is an important step forward, and gives assurance of sound basis which can be relied upon to end the disunion and misunderstandings formerly too frequent.

Finally, there was the visit to the seat of Lord Rothschild at Tring, with the splendid and unique Museum of his son and heir. Greeting his guests in three languages, he paid a most grateful tribute to his old friend and counsellor, Dr. Albert Günther, whom he had to thank for turning a boyish love for catching butterflies to an earnest resolve to devote his life to the study of Nature, especially concerning birds and butterflies. What he has accomplished is well known to us, notably in his classical work upon Sphingida, and here we were strikingly reminded of it. He also, like his comrades at Oxford, had provided us with special examples of the richness and variety of specimens contained in the Museum. It was the Ornithoptera of New Guinea and the Indian Archipelago, in all their gorgeous colourings, to which attention was specially directed. Where less favoured mortals think themselves lucky in possessing a single pair, here were magnificent rows exhibiting every possible variety.

A walk through the beautiful garden, radiant with flowers, a glance at the superb stables, a drive of twenty minutes to the station, and the Second International Entomological Congress was at an end.

Fritz N. WICHGRAF. (*Translated by L. R.-B.*)

A HOLIDAY IN NORFOLK.

By THE REV. W. G. WHITTINGHAM, M.A., F.E.S.

In a year which will long be remembered for the wettest and most disastrous August in our memories, an account of a collecting holiday which was in some respects distinctly successful, and had some unusual features, will perhaps be read with more interest than it would afford under more ordinary conditions.

An idea had been in my mind for a year or two of taking a collecting holiday on the Broads by the aid of a boat; and when

my friends, Rev. J. W. Metcalfe and Rev. J. E. Tarbat, proposed a joint expedition, the opportunity for putting one's idea into practice presented itself. Accordingly we engaged a twelve-ton yacht, and on July 29th I arrived at Potter Heigham on a most uninviting day, after a journey from Leicester, during which it had rained hard the whole time. My friends, who had already spent a week on the coast, where Mr. Metcalfe had made the interesting discoveries of *Lithosia pygmaeola* and *Crambus fascellinellus* he has already recorded, had established themselves on the boat and laid in stores. They described the consternation of the skipper when they arrived with their luggage, and his dismay when they told him the man who was coming would have much more. Our first proceeding was to go through a process of unpacking and sorting and stowing of necessaries into lockers; portmanteaux and bags and whatever could be dispensed with being despatched by carrier to Wroxham, where we expected our expedition to end. Even thus the spare bunk (there were four) was loaded with setting-boxes, lamps, and other paraphernalia, and we felt it was not altogether a matter for regret that a fourth member had not been persuaded to join our party. The boat was, however, well equipped with many ingenious contrivances, and answered our purpose admirably; and, as for the skipper, we could not have had one more pleasant and reliable, whose interest in our proceedings was genuine and increasing, although there was a smile in the background, especially in the presence of his mates; and if he did his best to make sailors of us, he, for his part, was ready to learn something about moths.

As soon as we were settled we took stock of the wind, and decided that it would be wise to go first up the Thurne to the purlieus of Hickling Broad and Horsey Mere. We lay up a little before dusk in a promising spot, and after supper set out with our hand-lamps. The evening was still though cold, and a certain amount of cloud gave hopes of a propitious start, but as the night came on the clouds dispersed and banks of white mist lay here and there. It was the kind of evening when nothing would fly, and searching at first only revealed a *Scoparia pallida* or two and *Crambus culmellus*, though a few *Leucania straminea* and *Calamia phragmitidis* were netted. The marshes were horribly wet, two or three inches of water everywhere, though later experience led us to regard that as comparatively dry ground. Mr. Metcalfe, who has intuitions of the right thing to do, had his attention attracted to a number of heaps of cut rushes that had evidently lain for a few weeks and had not been carried, and he soon shouted that here, creeping out of the heaps, was *Nonagria neurica (arundineta)*. We all set to work searching the heaps, and after a couple of hours we had secured between us two or three dozen. *Chilo phragmitellus* and a single *Apamea leucostigma* were virtually all the other moths we saw.

This success with an insect that on previous occasions had only been picked up in twos and threes determined us to stop for another night in the same place. The evening of the 30th was more promising, with more cloud and a fair breeze blowing, and we got out our sheets and lamps and had our meal early. While this was preparing, one of our number, strolling out with a net, shouted that *N. neurica* was already there. We had our meal, and netted a few *Cænobia rufa* before the more serious work commenced. We had high expectations, but none of us dreamed of the extent of our realization; *neurica* may be said to have been swarming. Nearly every heap of rushes produced one or two at least; most of them, especially in the wetter places, produced them in dozens and scores. Several were paired. The best heaps took us into very wet ground, and two of us went into holes half-way up our thighs and took an involuntary seat in cold water, but such incidents were of small account. We stopped at last almost ashamed of taking so many and got our lamps alight at the sheets, but here there was little result. The moon was shining now, and a couple of *Nonagria brevilinea*, a bright red *Spilosoma fuliginosa*, with a few more *C. phragmitidis*, *C. phragmitellus*, and *S. pallida* were all that came to our nets.

The presence of this insect in such large numbers in the cut reeds was very remarkable. Some of them had certainly pupated there, for we found one or two with the wings hardly dry. They could hardly, however, have crawled away from the reed-beds and found out the heaps for the express purpose of pupating in, in such numbers. The probability is that those which emerged there were already pupæ at the time when the reeds were cut. The presence of newly-emerged females, though in small numbers, would naturally attract males; but if this were the only explanation one would have expected to find a large preponderance of males, whereas the two sexes were in approximately equal numbers. Probably the coincidence of two or three causes brought about the result which proved so interesting to us—a specially good year for *N. neurica* (later experience bore this out), delay in the carrying of the cut reeds, some of which contained pupæ, and the rough weather, which sent numbers of insects to them for shelter. A few other moths were found in the same place. The females varied greatly in size; the largest I have measures 29 mm. from tip to tip across the expanded wings, and the greatest breadth of the fore wings is $5\frac{1}{2}$ mm.; the smallest is barely 20 mm. across, and the breadth is $3\frac{1}{2}$ mm. The males are more uniform, but invariably small.

We resolved that next morning we would be off to new ground, but next day brought a gale of wind and torrents of rain which made sailing out of the question, and with our hands full of insects to set we were content to stay, hoping to get off

in the afternoon. But the rain held till six o'clock, and we finally decided to make another night of it where we were. That evening it blew hard, though the rain stopped, and we made our way with sugaring-tin to the shelter of a clump of alders and oaks, and sugared the flower-heads. In the shelter of the trees all the moths out were flying, and there we had our solitary successful night with sugar. We took a number of *Apamea leucostigma*, including some good var. *fibrosa*. Flying were a few *L. straminea* and *Lithosia griseola* and *stramineola*. Such moths as *Apamea didyma*, *Triphaena comes*, and *Leucania impura* were in some numbers, as well as what appeared less likely on the marshes, *Agrotis nigricans* and *A. tritici*. *Calamia phragmitidis* was again present, and *Leioptilus microdactylus* was taken from the flowers of the *Eupatorium*; and on our way back (our consciences having quieted themselves since the previous night) we got a few more *neurica* from the reed-heaps, as well as one or two flying.

At whatever cost we decided to leave the next day, but our skipper had a new sail which he had no intention of reefing if he could avoid it, and as it blew very hard again, we waited till the afternoon. Two or three larvæ of *Arsilonche albovenosa* were found during the day, and a *Plusia festuæ* which emerged after pupating, on September 14th. At four o'clock we got under weigh. The wind fell into a dead calm, and some "quanting" and towing were necessary, and we finally lay up near St. Benet's Abbey at nightfall. We made hurried preparations, but the night proved unpropitious, and with one exception, which from other causes was a failure, all the remaining nights were clear and cool, with heavy dews, and hardly anything flew. Sugar and sheet were alike unproductive. At St. Benet's our hand-lamps gave us some *N. brevilinea*, in good condition for the most part, a few *A. leucostigma*, several *Tapinostola fulva*, both pale brown and a bright red form. *Epione apiciaria* was in numbers, as it was in most places, and we also took *Phibalapteryx vittata*, *Eupithecia tenuiata*, *Peronia shepherdana*, and *Pediscu semifuscana*, the last very varied, including the striking variety with white inner margin.

The next night we lay at Ranworth, and now we had hopes of *Lithosia muscerda*—hopes which were doomed to disappointment. *N. brevilinea* was again netted and taken at rest, together with most of the other moths already mentioned, including *N. neurica*, and in addition the following:—*Apamea ophiogramma*, *Coremia designata*, *Acidalia immutata* and *emarginata*, *Drepana falcataria*, *Selenia bilunaria* var. *juliaria*, *Ditula semifasciana*, *Penthina betulæana*, *Phoxopteryx siculana*, and *Grapholitha nisella* and *G. penkleriana*. A batch of *Peucedanum* gave larvæ of *Papilio machaon*, mostly full grown. A couple of pupæ were also found, which emerged later in August.

On August 3rd we lay at Horning, and here we had our solitary really cloudy night, and spent a hour before dusk before an alder-car, in the hope of seeing *Lithosia muscerda* fly, but none made its appearance, though a Norwich collector netted one on the road opposite the ferry. There was an east wind, and rain came on with the dark. When it ceased we again found *N. brevilinea* and other Noctuæ by searching. *P. vittata* came to light in some numbers, with *A. immutata*, a single *Eugonia alniaria*, *Nudaria senex*, and *Pyrausta aurata*. We had worked for Tortrices in the afternoon, but little appeared except a few of those already mentioned and *Grapholitha ramella*.

On Sunday morning we were at Ranworth Church, with its beautiful screen, and in the afternoon, when the river was alive with yachts, which add so much to the interest and charm of a Broadland holiday, we started to go up the Ant to Barton and Stalham for *Nonagria cannae*. Our skipper warned us to "stow well," but as the boat lay over, the table in the cabin, against which our insect-boxes were resting, broke away, and one of us went into the cabin to preserve order. Then came an amusing and for the moment alarming incident. A sudden gust of wind laid the boat with unreefed mainsail right over, and brought the water well over the combings up against the cabin-side. One of us on the stern counter drew up his legs and hung on for dear life, while the man in the cabin was bombarded with insect-boxes, lamps, a 7-lb. tin of carbide, and various impedimenta, and sudden spasms shot through us at the prospect of all those *neurica* coming to a miserable end. We ran the bows ashore, and lay on for the wind to moderate, and a rapid inspection showed that beyond the loss of a few pins no damage was done. We were soon able to proceed, and after lowering the mast to go under Ludham Bridge we ran up the Ant under the jib. A look round with the hand-lamps gave us again a *N. neurica* or two fluttering among the reeds.

The next day we took the dinghy, and, landing, set to work at the bulrushes for the pupæ of *N. cannae*. Our first results came from the stems of *Typha angustifolia*, working from the back—that is, the shore side; but presently, coming across a small clump of *T. latifolia* not more than a few yards square, we found a dozen in as many minutes. They were mostly pupæ, but we found three or four larvæ that had not yet pupated, one of which, at all events, has safely pupated since. *Nonagria arundinis* was naturally very abundant. Altogether we found two or three dozen *N. cannae*. It is advisable not to cut the rushes at first, but to pull away carefully the outside leaves, and when the pupa is seen to cut away the piece of stem containing it. The pupæ were subsequently laid on damp flannel, and at the time of writing several have successfully emerged, also some ichneumon flies!

From a large number of rushes the pupæ or larvæ had been eaten out. Is it rats or duck that eat them out in this way? It is always a little above the water-line, and the stem is well mauled. *Cannæ* larvæ appear to feed on the fringe nearest the shore, *arundinis* right into the deeper water; but in a wet season like this all the marsh is water-logged, and we were often knee-deep in getting them.

At night we added to our captures again *N. brevilinea*, red *T. fulva*, a large number of *P. semifuscana*, a single example of the bright Norfolk form of *Celæna haworthii*, and more *Nudaria senex*, *P. vittata*, &c. Two full-fed larvæ of *Chærocampa elpenor* were found during the day, one of the green and one of the brown form.

In the expectation of a strong wind, we were roused at 4.30 a.m. next day, and it was well we came away as we did, as a boat lying near us, which started a few hours later, lost her jib and got into difficulties. Five hours' hard work saw us again at Ranworth with keen appetites for breakfast.

During the afternoon our skipper, whose interest in Lepidoptera was growing apace, offered to row us round in the dinghy to find more pupæ of *N. cannæ*. The search proved fruitless, but the skipper, who was working on his own account, produced a damaged *typhæ* pupa, and what he termed "a wriggler," which proved to be the larva of a mosquito. It was summarily executed, but the serious toll of blood and subsequent irritation must be taken into account when collecting from a yacht.

The evenings became less and less productive. On this our last but one we took nothing but three or four *N. brevilinea*, a single *neurica*, and a few *C. phragmitidis*. On our final evening we lay off Wroxham Broad, probably in too cultivated a region for the best results. The day promised well, but the heavy clouds and close atmosphere which raised our hopes resulted in what Norfolk people call a "tempest," with drenching rain late in the afternoon, but afterwards it cleared up, cold and still, and stars were visible. The solitary moth that came to light was a *Noctua rubi*, but in addition to adding to our captures of *P. vittata*, *A. immutata*, &c., we took a good series of *Crambus selasellus* and a *Lobophora viretata*.

This was a poor enough ending, but on the whole, in spite of bad weather, of which we had every variety, wind and wet and cold, we had little reason to regard the holiday as other than successful. *Muscerda*, indeed, we did not take, nor did we see a sign of such insects as *Schœnobius mucronellus* or *gigantellus* or *Calamotropha paludella*. The special Broadland Micro-Lepidoptera were, with the exception of *Peronea shepherdana* and *Pædisca semifuscana*, absent; Tortrices as a whole, indeed, were very little in evidence, and common Noctuæ few in number, but *Nonagria cannæ*, *neurica*, and *brevilinea* were in themselves a

good return, and the extraordinary take of *neurica* is a thing to remain among the great collecting memories.

At the end of the cruise my friends left me, and I had a fortnight on the coast without them. A little bit of isolated marsh produced, among other things, *Cænobia rufa* in abundance, the second brood of *Eupisteria obliterata*, and some *Orobena straminealis*. On the sandhills the coast Noctuæ were not so plentiful as usual, and by day these regions seemed almost devoid of insect-life. At night, however, there were many interesting insects to be seen. *Agrotis tritici*, chiefly light, bright forms, but with some interesting dark varieties, was most frequent. *A. vestigialis* was also in some numbers, and *A. cursoria* more rarely. *Apamea didyma* and *Miana bicoloria*, which are generally abundant, were in quite small numbers. There were some *Leucania littoralis* and a few *Tapinostola elymi*, but this last was in poor condition, and scarcely worth taking. At rest on the marram-grass were several *Lithosia complana*, and sometimes this species flew to the light. In the same way *Aspilates ochrearia* (in plenty), *Anerastia lotella*, *Crambus geniculeus*, and some *C. pinellus* were found. This last insect, which hardly ever appears in any number, turns up in very unexpected places. I do not remember seeing it on coast sandhills before.

By far the most interesting insect that I captured on the coast was *Crambus alpinellus*. I came across it in considerable numbers, nor did I find, as Barrett records, that it was loth to appear during the day. It was the solitary insect that flew before sunset on the part of the coast where I found it. Unfortunately it deteriorated rapidly in the rough weather prevailing.

It was seldom worth while putting up the sheet. One night, however, which gave more promise than most, there flew to light, together with *L. complana*, some of the commoner Noctuæ, *Notodonta ziczac*, and curiously (as there was no oak for a considerable distance), *Drepana binaria*, once more, of all things, a specimen of *Nonagria neurica*! Who would have looked for this on a sandhill? There were, of course, drained marshes not far away, the grazing-ground of cattle and sheep, and in the ditches and by them a few lines and patches of reed remained, but mere fragments. It is curious that such an obscure insect should have found enough cover to hold its own, and have flown up to light away among the marrams.

Of Tortrices I beat out a few *Sericoris bifasciana* and *Eupæcilia atricapitana*, and from a cluster of pines a number of *Retinia*, whether *sylvestrana* or *posticana* I have not determined; they were a good deal worn. In either case they are interesting insects for the county and date.

After the deluge of the 26th, which left the county in such a deplorable plight, little was to be done, though I found *Crambus*

alpinellus had survived it, and *Aspilates ochrearia* was still in excellent condition. I was surprised also to take off sugared marram one example of *Dianthæcia cucubali* and one of *D. carpophaga*, in each case in very good order. I spent the last two days in inspecting some of the results of the flood, and in having a last determined search (I had made three previous expeditions) for the larvæ of *Eupithecia extensaria*. On my last day, and literally in the last hour, for it was five o'clock, and I was several miles from the place at which I was staying, I came across it. It was quite a satisfactory ending to a holiday.

NOTES FROM AN ESSEX LEPIDOPTERIST'S DIARY FOR 1911.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.E.S., &c.

(Concluded from p. 268.)

THERE was a good deal of wind and rain for the first half of the month of October, and very little outdoor work could be done. On the 10th I noticed that about forty larvæ of *C. phleas*, which had been hibernating under dead leaves, &c., suddenly began to feed again, and in the course of a few days rapidly increased in size, and I thought they were going to spin up and produce butterflies at the end of the month. One spun up, but failed to change to a pupa; the others ceased to feed after about a week, and eventually they all died. The mild weather during the middle of the month must have affected them. *Collix spartiata* began to appear in breeding-cages on 14th. The 18th (St. Luke's Day) was beautifully bright and warm, and the next day much the same up to noon, after which it clouded over. However, it felt very mild, and there was a soft south-westerly breeze; so I went to the woods and tried sugar. Moths were plentiful, particularly *C. vaccinii*; the others seen or taken were *Agriopsis aprilina*, *Amathes rufina*, *Scopelosoma satellitia*, *Agrotis segetum*, and *Miselia oxyacanthæ*; also *Oporabia dilutata* came fluttering round my lamp once or twice. This was my last night in the woods, as the weather became colder, and we had a spell of east and north-east winds. On the 20th *C. miata* was taken at rest on a wall. On the 25th there was a good deal of sun, though it was by no means warm. I saw *P. atalanta* flying in a sheltered place. There was a good deal of rain and wind throughout November, but it was mild for the most part, the only frosts being on nights of 11th, 22nd, and 23rd. *O. dilutata* was bred on the 1st, *Hybernia defoliaria* on 10th, and *H. auran-taria* on 17th. December, generally speaking, was mild, with a large amount of rain and occasionally heavy gales. The only

frosts were on the nights of 6th, 11th, and 22nd, and they were very slight. The last four days of the month were remarkably mild, with a densely overcast sky, and thick drizzly fogs on 28th and 31st. On 30th there was a little sun, and I saw bluebottles flying about, and spiders were spinning their webs. *H. defoliaria* was bred on 16th, a very dark, almost unicolorous, male; and on 29th I noticed a dead larva of *L. favicolor* hanging to the muslin hood of its breeding-cage. All my breeding-cages are kept in an open shed out of doors facing north-east. A mild, muggy winter is fatal to many hibernating larvæ; I have often come across them dead and flaccid when I have been pupa-digging, so they appear to suffer just as much in a state of nature as they do in confinement, in open weather.

Taking it all round, the very remarkable year of 1911, almost certainly the hottest and most brilliant on record, has not been an exceptionally favourable one for the lepidopterist. Many species that are usually plentiful in ordinary seasons were either very scarce or not seen at all. In the spring the hibernating Vanessids were hardly seen. I only noticed one or two examples of *urticæ* and *io*, and not a single *polychloros*, *atalanta*, or *cardui*, and in the autumn they only appeared in small numbers. *Polychloros* I have not met with for some years. The Pierids, too, were far from numerous, either in the spring or autumn. On the other hand, the second and third broods of *L. icarus* and *C. phlæas* were in great profusion. Bombyces, Noctuæ, Geometræ, Pyrales, and Tortrices were, with the exception of a few species, certainly far below their usual numbers. One of the chief features of the season was the abundance of individuals of some of the second and third broods (notably *L. pallens*, *N. c-nigrum*, *N. rubi*), and the smallness of the specimens, and, among the Geometræ, *T. amataria* and *A. emarginata*. Sugar seemed to have no attraction, except on the marshes, until long after midsummer, on account of the immense amount of honeydew, which was so thick on the leaves that an ordinary shower failed to remove it. It was also a very poor year for larvæ. In the spring the hibernating Noctuæ and Geometræ were by no means plentiful, and later on, at the end of May, such species as *H. defoliaria*, *H. aurantiaria*, *O. dilutata*, *C. brumata*, &c., were very scarce. The oaks and undergrowth in woods, which are often stripped of their leaves, showed very slight signs of having been eaten, and the usually abundant *Porthesia similis*, *Malacosoma neustria*, *Lasiocampa quercus*, &c., were few and far between. At the end of summer and early autumn there was no improvement. I did not notice any *Hadena oleracea*, which in most years swarms on the tamarisk, and only one or two *H. pisi*, two *Cucullia asteris* (often common on sea-aster), and very few *Smerinthus populi* on the poplars. The most common larva was that of *Phalera bucephala*.

In the woods it was just the same ; nothing was to be found on the aspens and sallows, and even in the cottage gardens, where in an ordinary season many of the cabbage and broccoli plants exhibit nothing but their ribs, the leaves last year were almost all intact.

Lee House, Dovercourt : Jan. 9th, 1912.

NOTES AND OBSERVATIONS.

CORRECTION.—By some oversight the legends to the figures of larval siphons in my paper on British Mosquitos in last month's 'Entomologist' were reversed. Fig. 4 represents *Theobaldia fumipennis* (Stph.) (= *theobaldia*, Meij.), and fig. 3 is *Th. morsitans* (Theo.). I should have stated that these two species belong to the group *Culicella*, now included by Dyar and Knab in *Culex*. In my opinion, however, the structure of the male palpi and genitalia and of the legs places them rather in *Theobaldia*.—F. W. EDWARDS ; British Museum (Natural History), September 24th, 1912.

LYCÆNA ARGIADES (LIFE-HISTORY OF): AN AMENDMENT.—My attention has recently been called to a footnote on p. 78, vol. iii., Tutt's 'British Butterflies,' which criticises my statements referring to the cannibalistic habits of *Lycæna argiades* larvæ as follows:—"Frohaw's details of this (Entom. xxxvii. p. 245) must be taken with caution. On p. 246 he states that 'all the eggs hatched on the same day, July 30th, 1904,' and that 'the first moult took place on August 3rd.' On p. 243 he stated that he 'noticed one larva, after the first moult, feeding on a newly hatched larva, which it had seized as it emerged from the egg,' which is very wonderful, if both statements be studied together." These facts are easily explained, as I find, on reference to my note-book regarding this species, an entry stating, "I received from Mr. Hugh Main, July 21st, 1904, some larvæ and ova laid by a female taken by Dr. Chapman, South France." The larva alluded to, after the first moult (Entom. p. 248), is one of those received on July 21st, which I had placed with the newly hatched larvæ on July 30th. I admit I might have made the statement clearer by mentioning the fact I had larvæ already feeding previous to those that hatched (July 30th) from the second lot of eggs received on July 26th.—F. W. FROHAWK.

NOTES ON COLIAS EDUSA, PYRAMEIS CARDUI, &c.—The present year gave promise of yielding large numbers of *Colias edusa* and *Pyrameis cardui*. I do not know how far the promise has held good, but my own experience has been disappointing. The first appearance of British-bred specimens that I noted was on July 20th, at Dover, where two male *C. edusa* and one var. *helice* put in an appearance. At the field meeting of the South London Entomological and Natural History Society at Otford, on July 27th, I personally saw three male *edusa*. From that time until August 17th I had no opportunity of observation, but on that date I went to South Devon until September

11th. The weather during my stay was unsuitable for butterflies, to express it mildly, but there was some sunshine, and I saw nine specimens of *edusa* altogether, the last on September 7th. *Pyrameis atalanta* was very plentiful, and there were a few *P. cardui*, *Vanessa io*, and *V. urticae* to be found, with considerable numbers of *Pararge egeria*, *P. mægera*, *Epinephele ianira*, *E. tithonus*, and other common butterflies, and mostly in battered condition. Insects were apparently somewhat out of date, for *Abraxas grossulariata*, *Lasiocampa (Bombyx) quercus*, and *Hydriomena furcata (elutata)* were not uncommon, and *Argynnis paphia* was seen at Tavistock on September 2nd. Local variation was disappointing; *E. ianira* differed little, if at all, from Kentish specimens, and the only species which showed signs of having been interesting was *E. tithonus*. Sugar proved attractive, yielding many common species in abundance, and Geometers were fairly plentiful in the hedges, but nothing appeared that I should not have expected in early to mid-August. The only fresh emergences I noted were *Pararge egeria* and *Mesoleuca ocellata*. No doubt the unseasonable weather accounted for this, and has, I fear, sadly lessened the numbers of *edusa* and *cardui*.—B. W. ADKIN; 8, Hope Park, Bromley, Kent.

COLIAS EDUSA var. *HELICE* IN KENT.—I am glad to record two very fine specimens of *Colias edusa* var. *helice*, taken by Mr. Bristowe, of this neighbourhood, during the last week in August near Minster-on-Sea, Kent. He saw one or two more during the fitful sunshine we had about then, but was unable to take them.—STANLEY A. BLENKARN, F.E.S.; Norham, Cromwell Road, Beckenham, September 17th, 1912.

COLIAS EDUSA var. *HELICE*, &c., IN CHANNEL ISLANDS.—It may be of interest to record the capture of two fresh specimens of *C. edusa* var. *helice*, on August 2nd, in Alderney. The typical form was very common. I also secured a fresh specimen of *Macroglossa stellatarum* on August 12th. In Guernsey I met with a newly emerged *H. jacobæe* on August 22nd. This is rather a late emergence, I believe.—HUGH G. LE RAY; 11, Wontner Road, Upper Tooting Park, S.W., September 4th, 1912.

COLIAS EDUSA, *PYRAMEIS ATALANTA*, AND *P. CARDUI* AT FOLKESTONE.—All these species were common at Folkestone in July from the 26th to 27th. Larvæ of *Macroglossa stellatarum* obtained at the same time and place duly pupated, and the moths are now emerging.—H. FLEET, JUNR.; 7, Park Road, Esher, September 14th, 1912.

COLIAS EDUSA IN SOMERSET.—I saw one male *C. edusa* yesterday in a stubble-field, the only one I have seen this year.—WALDEGRAVE; Chewton Priory, Chewton Mendip, Somerset, September 24th, 1912.

ABUNDANCE OF *PYRAMEIS ATALANTA* LARVÆ.—There has been a remarkable abundance of *P. atalanta* larvæ this year in our local nettle-beds. I could get as many as I liked in July, and so widely extended is the brood (or is it a real double brood?) that to-day (September 22nd) I have just brought home two pupæ and several larvæ, not all full-fed. But they seem delicate insects to rear; of

those I had barely 40 per cent. reached the final stage. Many died off in the change from the larval to the pupal stage, while some apparently healthy pupæ shrivelled up. I have never found the same difficulty with other species of the *Vanessæ*. As a matter of fact, I obtained this year about a score of *P. cardui* larvæ. They all fed up rapidly, and produced 100 per cent. of imagines.—J. S. CARTER; Warren Hill, Eastbourne, September 22nd, 1912.

CATOCALA NUPTA, ab.—On September 13th last a gardener at Uxbridge handed me a specimen of the above with the under wings almost entirely black, the usual red bands being scarcely distinguishable, a mere trace of very faint pink representing the lower of them. The fore wings, body, and thorax are also darker than usual; a very fine melanic variety in excellent condition luckily, although it had been put in a match-box.—FRANCIS B. WOODBRIDGE; The Briars, Gerrards Cross, Bucks.

CAMPTOGRAMMA FLUVIATA AND *PHRYXUS LIVORNICA* AT LEWES.—On the 17th inst. I took a nice fresh specimen of this insect near Lewes at rest on a grass-stem. Unfortunately it was a male. On May 27th last one of my brothers had a specimen of *P. livornica* fly into his house at Lewes about 8.45 p.m., attracted by the light. The capture was noticed at the time in a local paper, but has, I think, not yet appeared in the 'Entomologist'.—HUGH J. VINALL; "Torbay," Park Road, Lewes, September 25th, 1912.

DEILEPHILA GALII: A CORRECTION.—I regret to say I made a mistake in recording the finding of *D. galii* larvæ at Burnham (*antea*, p. 231). The larvæ were those of *Phryxus* (*D.*) *livornica*, and the first imago emerged to-day. The fact of the larvæ feeding on bedstraw misled me.—H. DOIDGE; The Bank, High Street, Taunton, September 18th, 1912.

NOTES ON *AGROTIS EXCLAMATIONIS*, &c.—The larvæ of *A. exclamatoris* have been very abundant in this neighbourhood during the past month, and have caused considerable damage in kitchen gardens among vegetables. They attack almost everything. I planted a quantity of young lettuces at the beginning of this month, dusting the surface of the ground with quicklime after the plants were put in, but in spite of this in a week there were none left. The larvæ—which at this time varied from half-grown to nearly full-fed—attack the plants just on a level with the ground, destroying the crown and causing the leaves to drop off. During the day they hide in the soil about an inch below the surface. I have turned up as many as eight or nine at the roots of a single plant. Carrots, onions, parsnips, &c., have been riddled, and stems of young broccoli, Brussels sprouts, savoy, &c., seriously injured. The larvæ that produced the first brood were also rather numerous when the ground was being dug over in the early spring. Local gardeners and labourers call them "leather-jackets," and it is a good name, too, for their skins are remarkably tough, as anyone can see who tries to crush them between his finger and thumb. They require to be dealt with with a sharp trowel. I have killed some hundreds lately. There is only

one thing that can be said in their favour, and that is that they are just as fond of the roots of weeds as they are of those of vegetables, and the roots of that dreadful garden pest, the lesser bindweed, are their special favourites. At the end of June and beginning of July a smaller larva with similar habits was nearly as plentiful. These produced *A. nigricans*, of which, fortunately, there appears to be only one brood.—GERVASE F. MATHEW; Dovercourt, Essex, August 19th, 1912.

TORTRIX PRONUBANA.—Last year I was able to record the occurrence of this moth at Weymouth. This year I can do the same for Bournemouth, where it seems to occur in fair numbers. The first specimen emerged on September 4th, the second on September 18th. —(Rev.) W. CLAXTON; Navestock, Romford.

NEW FOREST NOTES, 1911.—Having been interested in the fauna—especially the Lepidoptera—of the New Forest and neighbourhood for many years, before some of the young fir plantations were planted, it was with pleasure, and I trust profit, that I perused the communications on pages 126 and 158 of the present volume. I recollect the time when all three species of butterflies, viz. *Aporia crataegi*, *Leucophasia sinapis*, and *Melanargia galatea*, were to be had, but I never knew of either species being in very great abundance, even in their most favoured localities. I have taken *A. crataegi* amongst the thorns near Boldre Wood, and the last I saw alive were near Vinney Ridge many years ago, when, with the late Dr. Rake, we were searching for the sword lily (*Gladiolus illyricus*) at the end of July; we saw specimens of the butterfly in a very tattered condition settling on the thistle-heads, and little supposed it would be a final view; I believe that was in 1874. *L. sinapis* I have taken in several parts, but never commonly; perhaps the best locality was "Stubby," where its poor weak flight was to be seen in the grassy "ridings" of the "copse," where the dingy but then much sought-for *A. caliginosa* rose in a nervous flutter, soon to descend into its former hiding-place amongst the dry grass-stems, where its plain colour, so like its surroundings, made it difficult to find. *Melanargia galatea* I have seen near Boldre Wood, and in a damp open space between that place and Lyndhurst, but never in any great numbers, such as are seen in its favoured localities. As to "chalk-loving" species being sometimes found in the Forest, I may mention that on one occasion I took a fine male *Lycæna corydon* there. I recollect once finding the moon-wort fern (*B. lunaria*) growing, and a botanical friend was so sceptical on the point that he would not believe in the "chalk-loving plant," as he called it, being found there until I brought home some roots for him, so that there seems to be no absolute rule as to the locality where insect or plant may be occasionally met with.

The Satyrinæ, such as *Epinephele ianira* and its kindred; the small fritillaries, and others are still plentiful; and that fine butterfly, *Argynnis paphia*, is still a glorious spectacle as he majestically sweeps about the blossoming brambles, always ready to fight or frolic with a comrade; and since the earlier stages of the lethargic *Zephyrus*

betulae are better known to the present generation of collectors, perhaps more specimens than formerly reach the setting-board. But are *A. adippe* and a few others as common as they were? whilst some seasons, such as *S. megæra* seem to disappear altogether, and if we turn our thoughts to the moths perhaps a more marked diminution is observable. We seldom hear of large "takes" of *Diacycla oo*, or *Leucania turca*, or *Eneetra quadra*, and "still less of the little *L. assella*, which old Charles Turner—the "beetle man"—once took so commonly. I well recollect, too, the numbers of the pretty little burnet, *Zygæna meliloti*, I once saw floating, like small dark bees, over the bright patches of the golden-flowered bird's-foot trefoil near the railway. I understand none are there now, and if an inference may be drawn from the fact that at that time every possible specimen was netted and boxed by a very tall man (a dealer, I suspect), we need not wonder at the species becoming scarce. From the few foregoing facts it is clear that several species of butterflies (and moths) have disappeared and others become less common than formerly; but, on the other hand, is not *Plusia moneta* a comparatively new species to the neighbourhood? for, if I may judge from the number of its yellow cocoons found amongst monkshood, larkspur, &c., in some of the old gardens in the Forest, the moth has become quite an established "native"; thus some slight compensation seems to be offered for our losses, and if we try to investigate or find a cause for such changes, we come face to face with an apparently insoluble problem. The greed of collectors, parasitism, and our changing climate, cold, and damp have been advanced and discussed; and in a lesser degree the frequent and extensive fires, and even the increase of our small birds has borne some of the blame (but have they increased?); and as each point seems to arrive at some definite conclusion, do we not often find the experience of the following year "knocks the bottom" out of the argument? Some years ago the large white (*P. brassicae*) had become very scarce hereabouts, and my friend, the late J. W. Fowler, said undoubtedly it had gone like *cratægi*, but the very next season all the cabbage tribe and nasturtiums were skeletonized by the enormous number of the high-smelling larvæ of that particular species, and many pupæ were to be seen suspended by tail and waist-belt from almost every available position, and consequently a more than usual invasion of *brassicae* was predicted for the following season; but this did not come true, for in due course the various pupæ were found to be almost covered with the tiny yellow cocoons of the ichneumon whose work of destruction was complete—so much for parasitism. The extreme heat and unusual drought of 1911 during several months of the summer induced many ordinary single-brooded species to become double-brooded, and even a third family was produced in some cases, because, I suppose, the conditions were favourable for the stages in the early development, and it seems reasonable to argue that this is at least one of the chief factors in the future scarcity or abundance of any species. We are all well aware that in rearing insects a whole brood may be very healthy throughout their changes up to the pupa state, and then the entire family will die most miserably without any apparent cause; perhaps from a lack of something, in

our ignorance, we are unable to supply. When hibernating larvæ are exposed to the many changes and mishaps by which they are surrounded, it is extraordinary that so large a proportion should survive, hence the enormous fecundity of many species; possibly in some cases not one in a thousand reaches maturity. It sometimes happens that an insect gradually becomes scarce, and each successive year witnesses a decrease. In my collecting days the beautiful *Callimorpha dominula* was very common here, the moths in their heavy and undulating flight being often seen in the street, whilst the larvæ were common upon the nettles in the lanes, though their most usual food was the comfrey and meadowsweet by the river-side. Gradually the species disappeared, and now, as far as I can gather, it is quite extinct in its old haunts. It is obvious that the number of larvæ taken and bred in the hope of obtaining the yellow variety of the moth must have helped the decrease. But there were certain parts of the river where the larvæ perhaps were most abundant, and where collectors were forbidden to go; there the large rough leaves of comfrey grow as abundantly as ever, and the scent of the flossy meadowsweet fills the air, but not a vestige of *dominula* anywhere in any stage. Will it ever occur again?—G. B. CORBIN; Ringwood.

BUTTERFLY COLLECTING IN SICILY AND CALABRIA IN 1911.—On June 7th I took train to Syracuse (113 miles) with the intention to work back. I broke my journey at the junction station of Valsavoia, and spent three hours on the limestone slopes near the shore of Lake Lentine, but took nothing fresh. At Syracuse next day I found *Melanargia galathea* (var. *syracusana*, Zoll.) in plenty, but the other species I took are not worthy of mention except one fine *helice*. On the morning of June 8th I alighted from the train at Megara Hyblea, a solitary station where the trains stop to get water for the engines. The station master strongly protested against my getting out, and urged me to go on to the next station, assuring me there was nothing to eat there. I merely touched my bag and held my ground. The station is well protected by netting from mosquitoes, and the only building near is an immense old ruin, the town being situated on the low hills miles away. Passing the station in 1910 I had noticed here a swarm of *Melanargia galathea*, and in the field between the station and the sea I found the var. *syracusana* very common. By moving about a little I obtained specimens of *circe* fresh out, *helice*, and *phæbe*; and within the old ruins, where vines are planted, pairs of *podalirius*, *machaon* and *Vanessa* were chasing each other. I had a most enjoyable day, and left early for a less malarial locality. At Catania a friend joined me, and we spent the week-end at the village of Zaffarano, on the southern slope of Mount Etna. Mainly owing to the weather our visit was not the success we hoped for, our best capture being *gordius*, rather common.

We had an unexpected festa on June 15th, and my son could join me for a day. I chose Scaletta, where I had my drenching, being keen on "marbled whites," and I had spotted a possible locality there. We hired the only cab to take us as far as the road went up Monte Scuderi, and were soon set down at a village called

Italia. At a distance it is most picturesque, and worthy the attention of an artist. At close quarters the illusion vanishes, and dirt and gloom reign supreme. Being a festa the people were all at home, and were very civil and courteous to us. On leaving the village the path soon became very steep, and a typical little Sicilian lad of about seven offered to show us the best way up—he was going to the "family" patch of ground where his father was feeding the animals. We had to climb in some places, and presently my son, who was first with his net, shouted to me there was a lot of "marbled whites." I hurried up and just caught a glimpse of one as it flew away, the rest had all gone. I recollected *japygia* and its being always in a hurry, so we sat down and waited for the return of the fugitives; they presently returned, after having circled round, coming up the hill to us. When captured they proved to be a very large form of *japygia*. Higher up the path skirted a wheatfield, and here we were puzzled by taking *galathea* almost as large as *japygia*. On reaching the ridge of the slope we were on the wind was blowing a gale, and we had to take shelter a few yards down the shady side, where we were able to take both species in plenty. In the afternoon we braved the gale, and descended into the next gorge by an almost impassable pathway—only suitable for goats—to the village of Artolia. Below the breeze was not felt, and we found ourselves in the centre of the Sicilian silkworm industry. We were freely admitted into the rooms to see the worms and cocoons, and an attempt was made to initiate me into the art of buying ova, rearing worms, and selling cocoons, in order to make a profit. At the same time I noticed that one man was told off to follow us everywhere we went, a duty he performed until he had seen us safely off in the train. Well, a couple of foreigners with nets, who arrive by a goat track down the mountain side, might well incur a little suspicion. The dirty inns, dirtier tablecloth, and poor food, together with (to me) unpalatable wine, will not attract me there often.

Summer suddenly set in in the middle of June, bright sun and intense heat, which lasted until I had had enough of it at the end of the month, when I left for England.

On June 16th we went to Gioja Tauro, Calabria, to spend the week-end, the attraction being a good hotel—the nearest hotel south is thirty miles, and north over fifty miles—between are only dirty wine shops. Next day we visited the woods skirting the shore, known as the "Bosco di Gioja Tauro and Rossana." The heat was intense, and insect life in great abundance. The hair-streak *ilicis* was flying by dozens, and the herbage swarmed with a green beetle, while the small oak trees were denuded of leaves by various hued larvæ of *monacha*. Giant heaps of dead green beetles at the side of the path through the wood puzzled us until we learnt that the work-people collect the beetles from the vines in the adjoining vineyards, put them in narrow necked jars, cork them up, and next day, when the beetles are asphyxiated, they empty them in heaps in the wood. Owing to the oven-like heat our "bag" of butterflies was small, perhaps the most interesting species being *Melanargia galathea*, very large and very dark, approaching var. *turcica*. The following day we rested during the heat of the day, and on June 18th I decided to

visit the nearest hill in preference to another day on the plain. This was Monte Elia, at Palmi, the next station on the railway. At 1000 ft. altitude with a breeze the heat was just bearable. On reaching the ruined lighthouse at the top a fine specimen of *jasius* was a conspicuous object flying round like a bird, and this caused me to waste a lot of time trying to capture it. It had several narrow escapes before it flew right away. *Lathonia* was very common, but its quick flight, owing to the heat I suppose, made its capture very hard work; *galathea*, small and very dark, was also plentiful, and a couple or more worn *arge* disappointed me, as I wanted fresh examples. I rested next day, and on the following (21st) I quietly walked up our own torrent bed and was content to watch *podalirius* floating in the breeze, and *galathea* var. *procida* in its special valley. Then I descended to the cataract (cattarati), on my way picking up a series of the lovely burnet moth (*carniolica*) just out. Next I climbed the hill leading to Cammari by a mule track, until I reached the spot where I first took *japygia* in 1909 (one specimen only) and failed to get in 1910. After a long search, and when I had almost given it up, I disturbed a "marbled white," which flew off sharply, but, knowing its habit, I followed it quietly and captured a fresh specimen of *japygia*. The next day I went again and caught a fine series. Desirous of making the best use of the last week of my stay, I went to Scylla on the 24th and Reggio (both in Calabria) on the 26th. At the former place I found the headquarters for *arge*, but by this date the specimens were worn. Some cossus eaten trees attracted swarms of *Vanessa*, especially *polychloros* and including *io*, and in the wood fresh, dark *galathea* and worn *euphrosyne* were abundant; while in the open *lathonia* was plentiful and very active. At Reggio on the 26th the heat in the lemon gardens near the shore was overpowering, and the day was given up to *Charaxes jasius*. I had the good fortune to catch the first specimen we saw, but after that we were unlucky, and the numerous specimens we saw kept out of our reach. On the following day, the 27th, I visited Monte Cici and captured two *jasius* out of three that I saw. I may mention that earlier in the year my friends and I carefully searched for larvæ of *jasius* without success, as it is much best bred. On June 29th three of us climbed Monte Cici to look for *Libythea celtis* (I took this species here in 1909), and for more *jasius*. We saw no *celtis*, and only one *jasius*, which escaped our combined forces. The higher slopes teemed with local butterflies, of which we had already secured specimens. On my last day in Sicily, June 30th, I was charmed with a new brood of *podalirius* with abdomens suggestive of var. *zanclus*, on the lower slope of Monte Cici.

On my way back to England I broke my railway journey at two places. First at Pracchia (between Florence and Bologna) in the Apennines, a grand butterfly locality, the lovely Apennine fields being very charming, and second at the Swiss frontier Iselle, for the purpose of walking over the Simplon Pass. The heat was intense at Iselle, and butterflies were common, including *apollo*, just outside the station. Seeing it for the first time the flight of some specimens struck me as very peculiar. They seemed to brush the herbage on the ground with their abdomens as they flew along,

quite different to the flight of other butterflies, and it occurred to me that this may be the female's method of depositing her ova, in which action the horny pouch is of use. The Alps is by far the most prolific butterfly locality I have visited as regards species, but I need not enter into details, as numerous writers have already done so, except to say that I captured local forms of *galathea* at Berisal (5000 ft.) and at Brigne (2000 ft.) to compare with Sicilian, Calabrian, and Apennine forms. I reached home on July 8th with the heat-wave in full force.—J. PLATT BARRETT; "Westcroft," South Road, Forest Hill, London, S.E.

A PUBLIC BENEFACTOR.—Henry Watson Stockman, of Bolingbroke Grove, Wandsworth Common, was summoned before Mr. de Grey at the South-Western Police Court yesterday for damaging a growing tree on Putney Heath. The under-keeper said that he saw the defendant with a hammer knock off the bark of a birch-tree. He told the witness that he wanted to remove the caterpillars from their holes in the trees. Mr. de Grey: "Oh! he is a naturalist." The defendant: "Yes, sir. The keeper is quite ignorant of the damage done to trees by this particular kind of caterpillar." Mr. de Grey: "The authorities ought to be very much obliged to you, and you can go away. At the same time you must not do it again, for others may follow your example till there are no trees left." (Addressing the keeper), "You may not know, perhaps, but it is a fact that if this kind of caterpillar remains in the tree it would eventually destroy it." The summons was dismissed.—('Westminster Gazette,' Sept. 21st.)

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 23rd.—Mr. W. J. Kaye, F.E.S., Vice-President, in the chair.—Mr. H. W. Andrews exhibited specimens of the Dipteron *Brachyopa bicolor*, a Syrphid, from Bexley, with the Anthomyiid, *Hyctodesia scutellaris*, which it closely resembled.—Mr. Alfred Sich, specimens of *Ptycholoma lecheana*, bred on May 23rd from larva taken at Richmond on May 11th.—Mr. Cowham, a cocoon of *Dicranura bifida*, from which he had observed the imago emerge after softening a portion with a fluid which it had secreted.—Dr. Chapman, a larva of *Scolitantides orion*, in its first instar, mining between the cuticles of a leaf of *Sedum telephium*.—Mr. A. E. Gibbs, a large number of species of the genus *Cænonympha*, and read notes on variation, characteristics, and distribution of the various species in the Palearctic and Nearctic areas.—Mr. Kaye, the genus *Cænonympha*, referring particularly to the large size and minute ocelli of the under sides in Irish specimens of *C. tiphon*.—Mr. R. Adkin, *C. tiphon* from English, Scotch, and Irish localities, and remarked on their general local characteristics, and *C. pamphilus*, referring to the varied development of the eye-spots.—Mr. Sheldon, fine series of the rarer species, *C. hera*, *C. ædippus*, and *C. iphioides*, and remarked on the unaccountable absence from Britain of the extremely common European species, *C. arcania*.—Mr. Curwen, long and varied series

of *C. pamphilus* and *C. dorus*, and called attention to the occasional development of a row of submarginal spots on the fore wing.—Mr. Edwards, series of several species, including dark *C. arcania*, and species of the allied genus *Hypocistina* from Australia.—Mr. Turner, series of various Palearctic and Nearctic species, including *C. elko* from Vancouver.—HY. J. TURNER (*Hon. Rep. Sec.*).

RECENT LITERATURE.

Polymorphism in a Group of Mimetic Butterflies of the Ethiopian Nymphaline Genus Pseudacraea.

UNDER the above title there appears in 'Nature' (Macmillan & Co.), for September 12th, Professor Poulton's latest contribution to a subject which exercises a peculiar fascination over the mind of the naturalist concerned with the interpretation of mimicry based on natural selection. Two years ago Dr. Karl Jordan communicated to the Entomological Congress at Brussels his studies of the male genital armature of the *Pseudacraeas*, and deduced therefrom the specific identity of a large group made up of *P. eurytus*, L., and its numerous allies on the west coast of Africa, of Neave's *hobleyi*, *terra*, and *obscura* in Uganda, of Trimen's *rogersi* in Mombasa, and his *imitata* in Natal. As a further result this involved the remarkable conclusion that "the sexually dimorphic *P. hobleyi*, mimicking the sexually dimorphic *Planema macarista* in the Entebbe district, was the same species as the two monomorphic *Pseudacraeas* flying in the same forests with it, viz. *P. terra*, and *P. obscura* mimicking respectively the sexually monomorphic *Planema tellus* and *P. paragea*."

This identity of species remained to be confirmed by a complete knowledge of the life-history of the species, and in this extremely interesting paper Professor Poulton now informs us that Dr. Carpenter, working in one of the islands of the Victoria Nyanza, has succeeded in breeding out from a female *obscura* "with a touch of *hobleyi*" the butterfly known as *terra*, Neave. This welcome and conclusive proof, however, was not forthcoming in time for Professor Poulton to convey it to the Oxford Congress, the cablegram with the single word "*terra*" from Entebbe arriving about a fortnight after the President's communication of "Messrs. C. A. Wiggins' and Dr. Carpenter's researches on mimicry in the forest butterflies of Uganda." But with this evidence before us we may now be sure that the cospecification of all the forms of the *hobleyi* group thereabouts will presently be confirmed, and this in such a way as to place beyond all doubt the genetic relationship subsisting between them. This means that quite twelve species sink as mimetic forms of one; and, as it may reasonably be doubted whether so remarkable a case will ever again be presented, we may echo Professor Poulton's congratulations to Dr. Jordan, Mr. Wiggins, Mr. Neave, and Dr. Carpenter on the parts they have played in solving a bionomic problem of extraordinary interest and complexity.

Proceedings of the South London Entomological and Natural History Society, 1911-12. Pp. i-xvi, 1-104, with four plates. Published by the Society, Hibernia Chambers, London Bridge, S.E.

THE 'Proceedings' of this Society for the past Session contain an interesting Presidential Address by Mr. W. J. Kaye, F.E.S., dealing with the effect of last summer's abnormal temperatures upon the abundance or otherwise of insect-life, and also, shortly, with many very interesting facts connected with Mimicry, chiefly among Lepidoptera. We notice with regret that beyond a short but interesting paper by Mr. Lucas on "The Bracken," and some "Notes on the Season" by Mr. Adkin, there is a dearth of those papers which usually so greatly enhance the scientific value of the Society's publication. There is, however, a large mass of very interesting observations recorded in the Reports of the Meetings well worth perusal, and we must not forget the excellent Index.

N. D. R.

Catalogue of the Lepidoptera Phalaenæ in the British Museum. Vol. xi. By Sir GEORGE F. HAMPSON, Bart. London: Printed by Order of the Trustees. 1912.

THE Eutelianæ, Stictopterinae, Sarrothripinae, and Acontianæ are treated in the present volume.

In the first subfamily there are one hundred and seventy-five species, and these are assigned to twelve genera, *Eutelia*, Hübn., and *Pæctes*, Hübn., receiving over one hundred species between them.

Eurhipia, Boisd. (*t. adulatrix*, Hb.), *Pencillaria*, Guen. (*t. ablatrix*, Guen.), *Eleale*, Walk. (*t. plusioides*, Walk.), *Ripogenus*, Grote (*t. pulcherrima*, Grote), *Phalga*, Moore (*t. sinuosa*, Moore), *Zobna*, Saalm. (*t. snelleni*, Saalm.), *Targallodes*, Holl. (*t. oculatrix*, Saalm.), *Silacida*, Swinh. (*t. inextricata*, Moore), *Atacira*, Swinh. (*t. approximata*, Walk.), and *Alotsa*, Swinh. (*t. discistriga*, Walk.), are all merged in *Eutelia*, Hübn. (*t. adulatrix*, Hübn.).

Thirty-four species are referred to *Stictoptera*, Guen. (*t. cuculloides*, Guen.), and thirty-five to *Lophoptera*, Guen. (*t. squammigera*, Guen.). The remainder of the species, forty-three in number, belonging to the second subfamily, are distributed among eight other genera, including *Stenosticta*, Hamp., a new genus, the type of which is *grisea*, sp. n., from British East Africa.

Sarrothripus, Curt. (*t. revayana*, Scop.) comprises only twenty-four of the three hundred and thirty species placed in the third subfamily. Of the other fifty-seven genera twenty-one are new, and as regards fifteen of them have been founded for single species.

In the fourth subfamily there are six species fewer than in the preceding, but the number of genera extends to seventy, of which at least sixteen are new. The largest genus appears to be *Carea*, Walk. (*t. varipes*, Walk.), with forty-five species, and next to this is *Earias*, Hübn. (*t. chlorana*, Linn.), with twenty-four species.

Altogether nine hundred and forty-one species are presented in this volume, which is the eighth of the series dealing with Noctuidæ. This brings the total number of species in this family so far considered up to something over seven thousand species.

An Atlas of eighteen beautiful plates accompanies the volume.

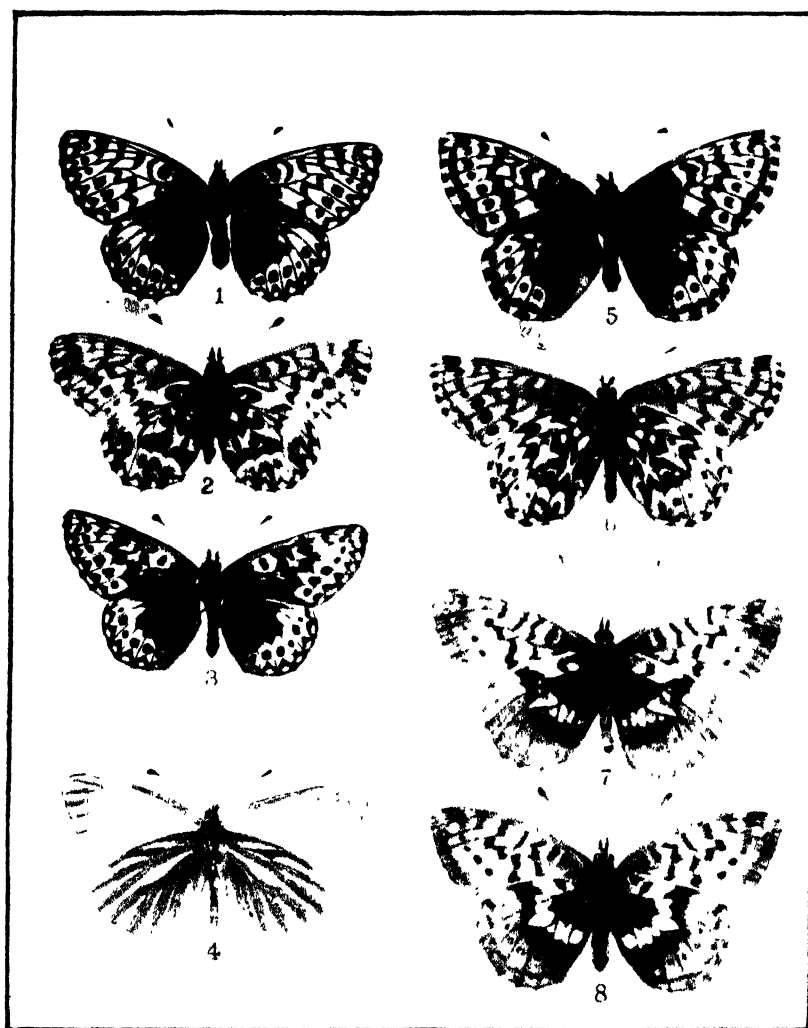


Photo H. Mann

Wet. Thomsen pro.

FORMS OF SCANDINAVIAN DIURNI.

- Fig. 1.—*Benthia freija*, Thunb., typical ♀. Abisko, June 25th, 1911.
 Fig. 2.—*B. freija*, Thunb., ♀ (under side). Abisko, June 18th, 1911.
 Fig. 3.—*B. freija* ab. *fasciata*, ♂. Abisko, July 3rd, 1911.
 Fig. 4.—*Pieris napi*, L., ab. *arctica*. Bossekop, June 19th, 1912.
 Fig. 5.—*Benthia polaris*, Bsd., ♀. Kolvik, June 28th, 1912.
 Fig. 6.—*B. polaris*, ♀ (under side). Kolvik, July 3rd, 1912.
 Fig. 7.—*B. frigga*, Thunb., ♀. Laxelv, July 12th, 1912.
 Fig. 8.—*B. frigga*, Thunb., ♀. Jemtland, June 5th, 1911.

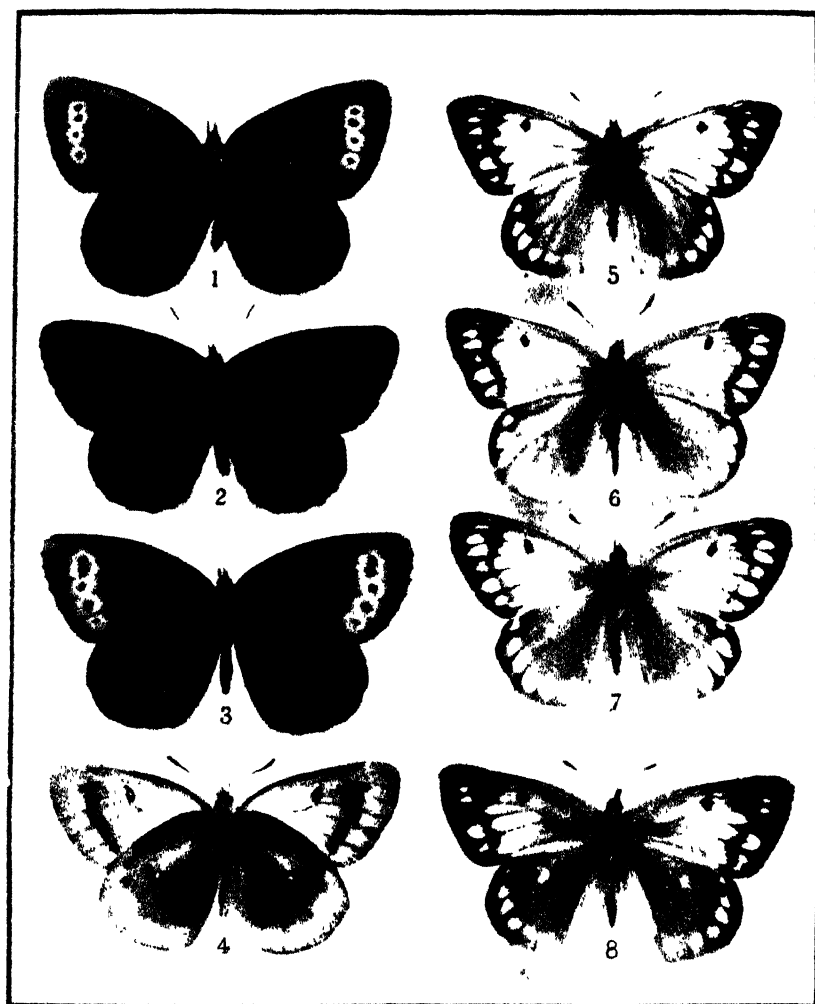


Photo H. Mann

W. C. Newman pro

FORMS OF SCANDINAVIAN DIURNI

- Fig. 1. —*Erebia disa*, Thunbg., typical ♂. Bossekop, June 21st, 1912.
 Fig. 2. —*E. disa*, Thunbg., ♂, ab. *obscura*. Bossekop, June 19th, 1912.
 Fig. 3. —*E. disa*, Thunbg., ♀, ab. *addenda*. Bossekop, June 19th, 1912.
 Fig. 4. —*Cobias hecla* var. *salitichma*, Aur.; ♀, under side. Laxely, July 11th, 1912.
 Fig. 5. —*C. hecla*, ♀, ab. *distincta* (dark border). Laxely, July 11th, 1912.
 Fig. 6. —*C. hecla*, ♀, ab. *ochrea-suffusa*. Laxely, July 11th, 1912.
 Fig. 7. —*C. hecla*, ♀, ab. *distincta* (light border). Laxely, July 14th, 1912.
 Fig. 8. —*C. hecla*, ♀, ab. *obscura*. Laxely, July 11th, 1912.



Photo W. G. Sheehan

W. G. Sheehan photo

DOLOMITE SCREENS KOLVIK PORSANGER FJORD

WHERE BRENT'S POLARIS AND ANARTA ZETTESSTEDT FLY



Photo W. C. Smith

W. C. Smith, Jr. photo

VALLEY OF THE LAXELV
THE HABITAT OF COLIAS NECLA

THE ENTOMOLOGIST

VOL. XLV.]

NOVEMBER, 1912.

[No. 594

THE LEPIDOPTERA OF THE NORWEGIAN PROVINCES OF ODALEN AND FINMARK.

By W. G. SHELDON, F.E.S.

(PLATES XI.-XIV.)

THE expedition which I made into Scandinavia in 1911 (see 'Entomologist,' vol. xlv. p. 357) did not enable me to observe certain species of Diurni which then evaded my search; these included *Colias hecla*, *Erebia disa*, *Brenthis polaris*, *B. chariclea*, *Melitæa iduna*, and *Latorina orbitulus* var. *aquilo*. The last four of these, so far as I am aware, have never been seen alive by my fellow-countrymen, whilst the only British record of *Erebia disa* I can find, is that Dr. Chapman took a few worn examples at Bossekop in 1896, and it was to get acquaintance with some at least of these species that I was, in part at any rate, induced to make another journey to the far north this year. I thought also, having worked out something of the life-history of *Colias nastes*, var. *werdandi* (see 'Entomologist,' vol. xlv. p. 122), I would like to try if I could not do something with that of the other purely Arctic species of this genus, *C. hecla*.

Of course there are many reasons why an expedition to Arctic Norway, to which district I decided this year to extend my operations, is one that has charms, apart from the Lepidoptera. The wonderful experience, perhaps unique throughout the world, of sailing for five days and nights, from Stavanger to the North Cape, through channels and fjords, passing thousands of islands, often approaching within a few feet of the precipitous shores towering many hundreds of feet above, the view continually changing the whole time; the beauty of the scenery, the great wealth of life continuously around one—birds, seals, and cetaceans—the bracing air, the perpetual daylight, and the charming Norwegian people, so honest, kindly, and obliging; all tend to impel one who has once been there to pay another visit.

I crossed over from Hull to Christiania on June 1st in the good ship 'Eskimo,' and, wishing to see something of certain southern Norwegian Lepidoptera, spent a few days in the neighbourhood of the well-known—to Lepidopterists—bog of

Disenæn, in the Province of Odalen. This bog has been worked by several British entomologists, and its fauna recorded. I could not find accommodation at Sæterstøen, where my predecessors had stayed, but I discovered a fair inn at Aarnes, the next station to Sæterstøen on the Christiania side, and a convenient train night and morning to convey me to my hunting-ground.

Being favoured with good sun on June 4th and 5th, I found plenty of butterflies. (*Eneis jutta* was in great numbers and fine condition; the males one found at rest on the pine-trunks just on the edge of the bog, flying wildly therefrom when approached; females, less in number, were mostly disturbed from the ground. An hour or two amongst this species sufficed to obtain all I required. In the two days I managed to acquire half a score fine examples of *Hesperia centaureæ*; they frequented the edge of the bog, in clearings amongst the last trees. The other speciality of Disenæn, *Erebia embla*, I nearly missed, for I had expected to find it either out in the open, or amongst the last trees; but about an hour before the sun went in on June 5th I happened to cut across a thick belt of pine wood some fifty yards from the open, and here I found this fine species plentiful. As many examples as I required, some twenty in number, were quickly obtained; they included four var. *succulenta* and one var. *unicolor*. Of the other species seen, the most interesting was *Chrysophanus amphidamas*, of which I netted several worn examples on the railway bank between Sæterstøen and Disenæn, a few hundred yards from the former railway station. This is interesting, because Herr Sparre Schneider writes me that this species has never been taken in South Norway by Norwegians, only by Englishmen, and as the only account of its capture there by an Englishman that I can find is that of the one example recorded in 'Entomologist,' xxxi. p. 215, by Mr. R. S. Standen, the confirmation is satisfactory and conclusive. Amongst other butterflies seen were *Euchloë cardamines*, *Cænonympha pamphilus*, *Hesperia malvæ*, *Pieris napi*, *Leptosia sinapis*, *Pararge hiera*, *Celastrina argiolus*, *Glaucopsyche cyllarus*, and *Rumicia phleas*, all fairly plentiful on the railway bank. Females of *Brenthis freija* were busily ovipositing out in the open bog, yards away from anything but mosses and lichen. An interesting and an unusual sight to me was the number of *Hemaris tityus* (*bombyliformis*) that were flying over flowers of a species of *Vicia*, eight or ten examples being in sight at once.

I fear that the fine bog of Disenæn will soon be a thing of the past. It has at present an area of several hundred acres, and is crossed in the middle by the railway. On the north side the swamp is still in its pristine condition, but the southern half has deep dykes cut in it, and the surface at the time of my visit was being turned rapidly into arable land, and I apprehend, from

what I heard at Aarnes, that the northern portion will follow suit very shortly.

On June 8th, the weather having temporarily broken up, I returned to Christiania, and calling upon the tourist agents respecting my passage to the far north, found I was confronted with a state of affairs which threatened to wreck my expedition at its outset. It appears there had been for some time dissatisfaction amongst the engine men on the Norwegian coasting steamers, and a strike of the whole of them was then imminent; the last steamer that would go north for an unknown period having left Bergen the previous evening. This was not a pleasant prospect and required consideration; but I finally decided to risk being stranded somewhere in the vicinity of the North Cape indefinitely, and taking the night express for Trondhjem, caught the Bergen steamer, the 'Richard With,' there early on the morning of June 9th, and sailed in her to Hammerfest, where we arrived in the small hours of the 12th.

Here the strike had taken effect, and the local steamers were all lying in a melancholy row in the harbour, with crews paid off, and fires raked out. For some time after my arrival I was nonplussed, and how to get to my destination, Bossekop, in the Alten Fjord, some fifty miles distant, I did not know. Fortunately I had heard whilst on board the 'Richard With' that there was a military station somewhere in the Alten Fjord, and coming across an army officer in the street, with whom I had travelled on the steamer from Trondhjem, I ventured to explain to him my dilemma, and my troubles were at once at an end for the time being, for this gentleman, who I afterwards found was the commander of the battalion in the Province of Finmarken, Oberstloitenant Nyquist, with the kindness and obligingness which are inborn in a Norwegian, insisted that I should come as the guest of himself and a brother officer in a motor-boat they had chartered, and in which they were proceeding to Alten. We left Hammerfest about noon and reached Bossekop shortly before midnight, my hosts most kindly landing me there before proceeding to their destination. After some difficulty I got myself and my luggage to the small hotel, but the good people were gone to bed and I did not get any supper that night.

At Bossekop I remained until June 23rd, on which day, taking advantage of the presence of a cargo motor-boat, I prevailed upon the captain to allow me to travel in her back to Hammerfest.

Bossekop and the Alten Fjord are by far the best known localities for Lepidoptera in Arctic Norway. Zetterstedt was there in the first half of the last century, and in 1860 Drs. Staudinger and Wocke collected from May until August. A very complete account of the locality by Staudinger is to be found in the 'Entomologists' Annual' for the year 1864, and the record

of captures is detailed in the 'Stettin Entomologische Zeitung,' 1861. In 1896 Dr. Chapman and Mr. Lloyd paid a visit, and in 1906 Mr. Rowland-Brown was there.

My chief reason for visiting Alten was to see a place so famous entomologically and botanically, for the flora for the latitude is very rich, but also I hoped to get specimens of *Cobias hecla* and *Erebia disa*, both of which occur there. I did not see the former species, but was fortunate, after several days' search, to stumble across a locality in which the latter occurred in some abundance.

In the small hours of June 26th, the strike having by this time fortunately ended, I left Hammerfest on board the small forty-year old trading steamer 'Kong Eystein,' on what turned out to be the rolliest and yet the most enjoyable voyage I have ever made. We steered first north-west to the island of Soro, then north-east to Rolfsø, Ingo, Hjelmsø, and Maaso, going outside these islands and calling at innumerable quaint little fishing stations, dropping here a little cargo, or a few passengers, taking up there some dried fish, a horse, or a cow, or some hardy fisher folk on travel intent. At Hjelmsø we passed close under a cliff haunted by millions of fowl of different species, and as the syren was sounded by the orders of the obliging captain for my edification, the air was darkened by their countless numbers. The swell of the Arctic Ocean, accentuated by the currents between the islands, made the little vessel rock fearfully and wonderfully, but she took the seas like a duck, and it was delightful to be on her deck amongst the marvellous surroundings the whole of the day.

About 9 p.m. we rounded that wonderful headland, the North Cape, where so many tourists go to see the midnight sun, and from which so few actually behold it, for this district is notorious for cloud and haze, even during midsummer. We steamed close under the gigantic cliffs, sheer and over one thousand feet in height, and passed Hornviken Bay into what is, in a sense, unknown Norway; that is to say, unknown to the tourist, who almost invariably stops at the North Cape, or who occasionally journeys in the large steamers through the Magerø Sound to Vadsø, in the Varanger Fjord, where the voyage of these ships ends.

Baedeker is silent respecting the intervening fjords, and, except for a solitary traveller journeying at intervals of years up the Porsanger Fjord to Karasjok, the capital of Norwegian Lapland, which is situated some hundred miles in the interior, or an occasional salmon fisher, the only people are those who dwell on their shores.

The inhabitants are chiefly Lapps or Finns, or a mixture of these races, with a very few Norwegian families.

The Porsanger Fjord, which was the one I proposed to visit,

is the one immediately east of the North Cape. It was discovered, entomologically, by the Norwegian lepidopterist, Herr W. M. Schøyen, who spent a considerable time there in 1878 and 1879. Since that date, except that his son, Herr T. Schøyen, visited the fjord in 1907, and Herr Sparre Schneider in 1907 and 1908, in which years, owing to bad seasons, the results were not good, I am not aware that anything has been done with the Lepidoptera.

In the early hours of June 27th the 'Kong Eystein' entered the quiet waters of the Porsanger Fjord, and a little before noon, on the west side, about half-way down, in a little haven known as Kolvik, I found a delightful place of rest. Kolvik is the headquarters of Herr A. Bye, the Porsanger Whiteley, who, in addition to selling everything the inhabitants of the district require, and buying everything they have to sell, runs an excellent private hotel, the frequenters of which are entirely his acquaintances and customers who may have occasion to pass up and down the fjord.

I spent a considerable time at Kolvik, making it my headquarters, and never was unintroduced foreigner welcomed with greater kindness, or more charmingly, than was the writer by Herr Bye, his family, and his guests.

The vegetation in the Porsanger is quite as luxurious, if not more so, than that of the much better known Alten Fjord. There is a great quantity of birch clothing the hillsides, which in sheltered places attains a height of thirty or even forty feet. With this is a sprinkling of mountain ash and black poplar. At the south end stunted Scotch firs begin to appear, and I am informed that a few miles further up country this tree attains a good size.

There is a very peculiar band of dolomite rock, several miles wide, which extends on both sides of the fjord, and which includes several islands. In all there are about one hundred islands scattered about, the resort of countless flocks of geese, duck, gulls, cormorants, divers, waders, &c., which resort to them to breed. Whales are frequent, and were seen on several occasions.

After remaining at Kolvik for a week, I took advantage of the visit of the local steamer to cross to Børselv, on the east side. The population of this village is entirely Lappish, and quarters were found at the postmaster's, who has a wooden house of two rooms, about twelve feet by eight feet, and six feet high, in one of which he and his family lived and cooked and slept; the other was the post-office, and this I occupied during my stay, sharing it during a portion of the time with another individual.

A quaint incident occurred here. I had noticed on arrival my host regarding me not altogether with approval; a little

later on I found that the reason was that his only spare bedstead was but five feet six inches long over all, and, as it had raised solid wooden head and foot, it was obviously not a suitable place of repose for a man something over six feet in length! However, he was energetic and obliging, and during the evening the district was ransacked, with the result that shortly before midnight he was seen approaching, with a neighbour, bearing in triumph a bedstead of a size almost long enough to accommodate King Og of olden time, and in which I was installed with great ceremony in due course. It proved to be a very comfortable couch; in point of fact, I passed most of my time on it whilst at Børselv, for the weather at this period was the worst I have ever experienced in any country—an icy cold north-west gale blowing, with squalls of rain, almost the whole of my stay. I did eventually get a few hours of sun, during which, however, I could not find the particular species that was the chief reason of my visit—*Lattiorina orbitulus*, var. *aquilo*, which Schöyen met with abundantly in 1879. With good weather, Børselv is a very desirable place to stay at, and I should, with these conditions, expect to find there most of the Diurni occurring in the district.

There is a good driving road from Kolvik to Laxelv, which is situated at the extreme southern end of the fjord, some thirty-five kilometres from the former place. On July 10th I hired a Lapp to drive me to Laxelv; the journey is vividly impressed on my memory by the eccentricities of the driver, who, after subjecting me to several hairbreadth escapes from disaster and the loss of my umbrella, succeeded in overturning the cart within one hundred yards of my destination. Fortunately I had not liked the appearance of that particular stretch of road, and did not happen to be in the cart just then, or my wanderings would most probably have come to an end—at any rate, for a time. All my luggage, except my boxes of specimens which I was carrying, was thrown out, and came within an ace of floating down the Elv, which was only a few feet away from the scene of the upset.

At Laxelv I found quarters with the schoolmaster, Herr Nilsen, whose house is romantically situated on an island formed by two branches of the river, birch-clad, but with glades and meadows of charming Arctic flowers, and in every respect a delightful retreat. From Herr Nilsen and his excellent Fru I received every kindness, and morning and afternoon there was always one of his numerous family of frank and friendly small children ready to ferry me across the Elv. It did not in the least matter whether it was a boy or a girl; they were equally efficient in piloting me safely across the turbulent waters.

Laxelv will always dwell vividly in my memory. It was here, on July 11th, I first saw that exquisite Arctic butterfly, *Colias*

hecla, which was in such abundance that I selected over sixty perfect specimens in a few hours out of perhaps three times that number netted. It will be understood what a treat it was to a lepidopterist to see the swarms of this beautiful species, after a week of storm and rain, passed chiefly in a Lapp hut, with a diet of, for the most part, sweet coarse rye bread and goat-cheese.

My return journey to Kolvik, on July 17th, also nearly resulted in disaster, for at one of the two rivers which have to be crossed in a ferry-boat a cord slipped just as the cart containing the whole of my possessions was being got aboard, causing it to slide down the bank—which shelved rapidly—into the water and to come within an ace of being engulfed. By strenuous exertions, however, the driver and I managed to get my luggage out and placed in safety on the bank just in time.

(To be continued.)

THE GENUS *ITHYSIA* (HUBNER).

By J. W. H. HARRISON, B.Sc.

As Mr. Prout has shown that the correct generic name of this group is *Ithysia*, I am adopting it in place of the more commonly used *Nyssia* (Dup.), which includes, in addition, the species I have included in my genus *Pæcilopsis*.

It was not my intention to supplement my notes on the Bistoninae, published in the 'Entomologist' for July, 1910, until I had completed my work on the group, but I have been compelled by force of circumstances to publish the result of my investigations on this genus. As the genus now stands in our lists, it includes the three species, *Ithysia zonaria*, *I. alpina*, and *I. græcaria*, or, as we now call them, *Nyssia zonaria*, &c.; but I find that there are four species in the genus. These are:—

Ithysia zonaria (Schiff.).

I. alpina (Sulzer).

I. italica, sp. n.

I. græcaria (Bdv.—Staudinger).

To simplify the descriptions of the species it will be well to give here the scheme I have adopted in dealing with the various hybrids I have reared in this family.

I look upon the fore wings in the "ideal" species as being crossed by three transverse lines, which may or may not be obsolete in any given specimen. The first three, viz. first, median, and second, are dark coloured. The fourth or sub-terminal I look upon, for the sake of simplicity, as the white or pale band, which is generally followed or preceded by a strong

blackish or brownish suffusion. The hind wings are much the same, except that the first line is only exceptionally present. Both wings have a white discal spot, surrounded by a blackish ring on the transverse vein. These spots may be absent.

I have previously suggested that *alpina* and *græcaria* should be separated from *zonaria*, but I am sure now that the separation, as far as *alpina* is concerned, was premature. This species I consider to be generically the same as *zonaria*. There are a few structural points, such as the stronger antennal pectinations and the absence of cornuti on the vesica in the genitalia, which might be used to separate the two species *italica* and *græcaria* from *Ithysia* under the generic name *Melanocoma*, but I prefer to call all four *Ithysia*.

The relation between the forms or species has been very obscure in the past, partly owing to the difficulty of obtaining them, and partly on account of their great variability. I hope that this paper will clear up this confusion. I shall deal with the males of each species separately, but for the purpose of comparison I shall treat of the females as a whole.

ITHYSIA ZONARIA (Schiff).—This species has caused no confusion, as it is very widely distributed, being found throughout North and Central Europe, and extending even to Armenia. The type of the species, as found in Central Europe, has very dark markings—so dark, indeed, are they that they are nearly black. Our specimens (var. *britannica*, *mihi*) have much greyer markings, which tend to be obsolete inward from the præsubterminal suffusion.

In var. *rossica* (*mihi*), from the Ural Mountains, the specimens are very small, with strong dark markings and a line-like subterminal band.

For the British form, almost totally suffused with smoky black, I propose the name *obscura*.

I. ALPINA (Sulzer).—*I. alpina* was first described by Sulzer in 1776 from specimens taken in Switzerland, but when the plates were reissued by Roemer in 1789, he "emended" Sulzer's name to "*alpinaria*," and this name was used by Herrich-Schäffer in 1850, and Millière, in 1864, for the same species. In 1840, however, Boisduval described the species as *bombycaria*, and in this he was followed by De la Harpe in 1852. Guenée, too, used the same name.

Alpina is most readily differentiated from the others structurally by its very weakly pectinated antennæ. The pectinations themselves are exceedingly short, and at least six joints are without them, and those on the seventh are barely discernible. The ground colour of the wings is a slightly glossy white, very faintly speckled with brown in some specimens. The fore wings are traversed as usual by the three lines and the subterminal white band. All of the lines are thickened, more

especially on the veins and before vein one. This thickening is especially marked on the median line, and extends for a space of 8 mm. at the costal end of the line. The directions of the first and median lines call for little comment, but that of the second line is exceedingly important. It proceeds from the inner margin, through the lower angle of the cell, to the fifth vein, and then proceeds with a sweeping curve almost the exact quadrant of a circle to the costa. In most specimens the median line is much nearer to the second line than to the first.

There is generally a white discal spot surrounded by a blackish ring. The subterminal white band has a strong brown-black suffusion before it, and a weaker one after. In a fair percentage of the specimens the terminal suffusion is absent, and then the insects assume a very different appearance. I call this form *ab. extincta*. The same type of markings holds on the hind wings, except that the first line is absent, and the median one nearly so. The discal spot and pupil are clearly marked on the hind wings. In all wings the veins tend to be outlined in dark fuscous. The termina of all are quite rounded, giving us a crescent of almost perfect shape as the outline of the fore wings, and a semicircle for that of the hind wings. The thorax is densely covered with almost white fur above, tending to brownish below, and the patagia may be outlined in brown. The body is dark brown, more or less densely covered with greyish hairs or fur. The genitalia are very simple, but are quite satisfactory, for they afford us excellent characters for separating the species. The valves are very short for the size of the insect, *i. e.* when compared with other members of the group. The upper margin is concave, whilst the lower is slightly so for five-sixths of its length, when we have a strong upward curve to the rounded tip, giving the valve roughly the outline of a pruning-knife. The costal ridge on the valve is wide, and is slightly raised.

The uncus is much the same as in the other species, except that the point is longer. The gnathos (the broad chin-like plate below the uncus) is wide, with a broad and slightly roughened tip, and is notched at the base. Its surface is squamous. The oedeagus is short and stout, whilst the vesica is provided with a few claw-like cornuti. The tergite of the eighth abdominal segment is slightly thickened, and is divided into two lobes.

I. ITALICA, sp. n.—This species has been assigned to both *alpina* and *gracaria* by various authors, a fact that seems strange until one is acquainted with the fact that very few of the older authors possessed all the forms. The first author who dealt with this form was Scriba ('Beitrage' iii. p. 215 (1793)), who imagined he was dealing with Sulzer's species, and used Roemer's emended name "*alpinaria*" for it. In this he was followed by Esper (Band v. Heft 9) in 1803, Hubner in 1796, and later by Duponchel. It is noteworthy that Esper's form was the darker

form renamed *florentina* by Stefanelli in 1882, and treated by him as = *græcaria*, Boisduval-Staudinger. As *alpinaria*, Bork-Scriba, was the first form described and the name is invalid, I propose the name *italica* for the species.

The ground colour of *italica* is a somewhat glossy grey slightly mixed with light brown scales.

We have the usual four lines, but the first and median are only faintly marked except on the costa, where they are suffused. In the direction of the second line we have a most important character to distinguish this species from its congeners. All the lines start from the basal half of the inner margin and then strike very obliquely outward until vein one is reached. This point is perfectly reliable to separate *italica* in all its forms from *græcaria* and *alpina*. After vein one the first two lines go as in the other species. The second line, as in *alpina*, then strikes across the wing to the lower angle of the cell, and then, unlike that species, it continues parallel to the termen, which is not strongly curved near the costa. The median line is midway between the first and second line. None of the lines are thickened, but become darker as they cross the veins.

The subterminal band, owing to the weakness of the suffusions and the lines, is not so broad and rarely shows up so well as in *alpina*. The same differences are observable in the lines on the hind wings, but, owing to the difference in shape in the hind wings of the two species, both the median and second lines are nearer the base of the wings and are more parallel, with the result that very often the thickened second line crosses and obliterates the discal spot.

In shape the wings are very characteristic. The fore wings are markedly longer than the hind ones, and the termen is much less rounded than in *alpina*. In the hind wings, as the upper angle is much produced, the wings are much broader than in either *alpina* or *græcaria*.

The antennæ are markedly different from those of either *alpina* or *græcaria*, being very long and having very strong pectinations, which extend to the apex on the outer side, but are absent for the first four joints on the inner side. The pectinations, as well as being longer, are thicker and blacker than those of *græcaria*. The thorax is broad, and is covered with grey fur, whilst the abdomen is brown and is more or less covered with greyish hairs. The genitalia, too, are very distinct. The valves are much longer and broader than those of *alpina*. The upper margin is not concave, as in that species, but for about two-fifths of its length is straight. There is then a slight dip followed by a rapid outward curve. The outer margin is very slightly hollowed; then it turns upward, not with a bold curve, but with a slightly concave sweep until it reaches the downward curve of the upper margin. The costal ridge is narrow.

The point of the uncus is very short. The gnathos is much narrower than that of *alpina*, and instead of being indented at the base proceeds outward in a straight line until the curved extremity is reached. It is much more strongly squamous than in *alpina*. In general shape it is not unlike some forms of the shells of the genus *Pecten*. The oedeagus is short and stout, and the vesica is merely thickened where the cornuti ought to be, for they are absent. The eighth abdominal tergite is not thickened.

I. ITALICA var. FLORENTINA (Stef. nec GRÆCARIA, Bdv.-Staud.).—In this form the ground colour is strongly suffused with light brown, whilst the markings and suffusions are much stronger than in the type. The thorax is quite brown.

I. ITALICA var. CARNIOLICA, nov.—In this variety the ground colour is grey heavily suffused with blackish scales, whilst the markings and suffusions are colder in tone and much stronger than in the type. The thorax is dark grey.

I. GRÆCARIA (Bdv.-Staudinger).—This species was erected by Staudinger definitely in 1870, as Boisduval's name was without definite description, although proposed in 1840.

The ground colour of the wings is a dead grey, slightly mixed with yellow or brownish scales in the type, and in this deadness of the colour we have a contrast to the gloss of *alpina* and *italica*. The yellowness of the ground is stronger in the hind wings. On the fore wings the first, median and second lines are all present, as well as the subterminal band. The median line is very near the second one, which, at the fifth vein, takes a rapid inward sweep to strike the costa nearly at right angles. The subterminal white band has both of the usual suffusions, and is broader and less prone to be scalloped than in the other two species. The markings on the hind wings have the same characteristics. Both the suffusions and the lines on all the wings are more line-like than in the other species, and this character in the second line of the hind wings is very important. The veins are not outlined in black or brown.

The shape of the wings in this species is quite different from that of *alpina* and *italica*, for the fore wings, in proportion to the hind wings, are much shorter. In the hind wings the inner margin is not markedly less than the costal margin, so that the upper angle of the wing does not project as far as in *italica*, but is even rounded and turned in toward the base. The termen of the fore wings, too, is more rounded than in *italica*.

The thorax is grey, slightly brown mixed, and is not very broad, whilst the abdomen is brown with paler hairs. The antennæ are shorter than those of *italica*, and, while more strongly pectinated than those of *alpina*, are less strongly so than in *italica*. The pectinations, too, are thinner. The

antennæ are not pectinated to the apex, for five joints possess no pectinations, whilst on the four before these, those on the inner side are much shorter than those on the outer side. The genitalia come next. The valves are of a totally different type to the others. They are much broader. The edges are parallel, the upper side being slightly hollow and the lower convex. Instead of having a tendency to being hooked at the extremity they are evenly rounded, like the end of one's middle finger. They are actually broader toward the end than in the middle. The costal ridge is very broad, and is scarcely defined.

The gnathos is broad, squamous and rounded, and more like that in *alpina* than that in *italica*, but it is only slightly indented, not notched at the base. The aedeagus is shorter and stouter than in *italica*, and, as in that species, the vesica lacks cornuti.

I. GRÆCARIA var. ISTRIANUS, Staudinger.—This form is much whiter than the type, and the markings are weaker generally, although variable in this respect.

The Females.

The female of *zonaria*, owing to the golden yellow bands, is readily separated from the others, although I possess an absolutely black female (ab. *nigra*) from Russia.

The females of the other three species, at first sight so much alike, are easy to distinguish after a little practice. In all, the bodies are black, more or less closely covered with white hairs. The rudimentary wings are white above, and are darker below. The tips and base are well supplied with strong white hairs.

Alpina is the easiest to separate, for sometimes the fur is yellowish, and, in all cases, the insect is more thickly covered with pale hairs. The great point of difference is, however, that the face and collar are white, whereas they are black in the others.

At first sight, to recognize the other two seems a difficult problem, but close examination soon removes the difficulty. The most obvious point of difference is that the thorax of *italica* is much broader than that of *græcaria*, and, like the rest of the body, is covered with fewer and shorter white hairs. The wings, too, are clearly less hairy, and, although in both species they are white above, in *italica* they are jet-black beneath, whereas in *græcaria* the under sides are blackish slightly mixed with whitish scales. The tips of the wings in *italica* are more pointed. The antennæ in *græcaria* are slender and the joints are well marked, but in *italica* they are thicker and the joints are masked by the close covering of scales. Compared with *græcaria*, *italica* possesses enormously stout and strong legs, and the difference is nowhere more definitely seen than in the femora and the

tibiæ. However, the differences are better taken point by point, thus:—

<i>italica.</i>	<i>græcaria.</i>
Femora and tibiæ much broader, but less strongly scaled.	Femora and tibiæ weak.
Scales on legs all black.	Both white and black scales on legs.
Scales weakly toothed.	Scales strongly toothed.
Spurs ninepin-shaped, thick.	Spurs cone-shaped, not thick.
Femora somewhat regularly club- shaped.	Femora concave on upper edge.
Tibiæ weakly haired.	Tibiæ not strongly haired.

In the legs, *alpina* and *græcaria* resemble each other, but in *alpina* the femora and tibiæ are even weaker than in *græcaria*, although the scales are a trifle broader.

I shall now close my paper by giving a list of the localities whence the various forms I have described were received:—

- I. zonaria.* Central Europe.
- var. *britannica.* England.
- var. *rossica.* Ural Mountains.
- var. *obscura.* England.
- I. alpina.* Switzerland, Tyrol.
- I. italica.* N. Italy.
- var. *florentina.* Florence, Modena.
- var. *carniolica.* Carniola.
- I. græcaria.* Greece.
- var. *istriannus.* Carniola.

THE FEEDING HABITS OF SCORPION-FLIES (PANORPIDÆ).

By F. W. & H. CAMPION.

DURING the present year we made a few experiments with the object of discovering, for our own satisfaction, the kind of food consumed by scorpion-flies in their adult condition. At Ickenham, Middlesex, we obtained a living pair of *Panorpa communis* on May 19th, and placed them in separate glass-bottomed boxes. At 7 p.m. on the following day a live Aphid and a small live Muscid were introduced into the box containing the male *Panorpa*, and a live Aphid and a small dead Muscid into that holding the female. The next day, May 21st, the female was observed to be feeding on the dead Muscid. The male did not interfere at all with the living insects in its own box, but feeding soon took place when the dead Muscid, previously fed upon by the female, was offered to it. By nightfall on May 21st both the *Panorpa* were in a moribund condition, and were therefore killed off.

At Oxshott, Surrey, on May 29th, a male of *P. germanica* was enclosed in a box with a small living spider. Apparently, each arthropod was afraid of the other, and, as the *Panorpa* refused to feed, the spider was killed and replaced in the box. The scorpion-fly was then repeatedly observed to be feeding with manifest relish upon the dead spider, moving its wings and abdomen while doing so.

On May 31st a living micro-lepidopteron (probably *Catoptria ulicitana*) was presented to another male of *P. germanica*, also at Oxshott. Both insects were shy of each other, but, an hour after the moth had been killed and again presented, the *Panorpa* was found to be feeding, and its meal lasted fully half an hour. By that time the abdomen of the moth was entirely consumed. In this case feeding was not accompanied by movement of the wings or abdomen. Later on the same day a killed moth (*Bupalus piniaria*) was given to the *Panorpa*, but the scorpion-fly died without feeding having been observed.

Our observations tend to show, therefore, that, although the timid scorpion-flies are undoubtedly carnivorous insects, they feed upon dead animal matter, and do not catch and devour living prey. Mr. W. J. Lucas has also arrived at the conclusion that "it is perhaps established that in the imago stage they suck the juices of dead or injured animals, but do not hunt them down themselves" (Entom. xliii. p. 186 [1910]). It is not at all clear, however, whether adult Panorpidae are really as short-lived as they appear to be, or whether, in a state of nature, they get nourishment at more frequent intervals than did the subjects of our experiments.

58, Ranelagh Road, Ealing: October 9th, 1912.

NOTES ON SEITZ'S 'MACRO-LEPIDOPTERA OF THE WORLD.'

By T. D. A. COCKERELL.

I HAVE just obtained Seitz's magnificent work, so far as published to date, and am truly astonished at its excellence and cheapness. It is a great privilege to be living at the time of publication of such a book. Going through the several parts I have noted a few things which may be of interest; relatively trifling matters, but perhaps deserving notice at this time.

Pieris brassicæ var. *obscurata* is nearly the same as var. *nigrescens* (Entom. xxii. p. 55), which is based on the form from near Perth described by Newman and in Entom. iv. p. 258. The original publication of the name *nigrescens* is hardly sufficiently explicit.

Anthocharis cardamines var. *minor* (Entom. xxii. p. 176) is

not *turritis*, but is the dwarfed form (*hesperidis*). The name *minor* has priority. The form of the male with yellow instead of orange tips is *aureoflavescens* (Entom. xxi. p. 189; Entom. Amer. v. p. 34).

Colias hyale var. *pallida* was originally applied by Robson and Gardner (and also in Entom. xxii. pp. 4, 56) to the light form of the female, properly the typical form. The variety *pallida*, Tutt, may be named *pallidior*.

C. electo var. *aurivillius* is the same as var. *pallida* (Entom. xxii. p. 5).

C. wislotti alexandra, Stgr., if a subspecies, is unfortunately named, since there is an American species with the same name.

C. edwardsii is not from Virginia. The white female of *C. philodice* was named, long ago, *pallidice*, Scudd., *alba*, Maynard (cf. Entom. xxii. p. 5). Similarly the white female of *C. eurytheme* has earlier names, one of which is *pallida* (West Amer. Sci. 1887. p. 217); see also Scudder's 'Butterflies of New England' for full details.

C. (Meganostoma) cesonia var. *rosea*, Stgr., appears from Skinner's catalogue to be preoccupied by var. *rosea*, McNeill, 1889; but McNeill wrote *rosa*.

C. croceus var. *poreli* is *pseudomas* (Entom. xxii. p. 26), and the later *obsoleta*, Tutt.

C. croceus var. *pyrenaica* is probably *minor* (Entom. xxii. p. 176). The ab. *cerulea* is evidently close to *purpurascens* (Entom. xxii. p. 3).

Neophasia princetoniana is from Arizona, not from Illinois.

Epinephele tithonus vars. *subalbida*, Verity, and *albida*, Russel, are *pallescent* and *albidus*, Entom. xxii. p. 3, but there rather insufficiently indicated. For *pallescent* see also Entom. xix. p. 230.

Pyrameis cardui var. *minor*, Canad. Entom. 1890, p. 57; Ent. Rec. 1890, p. 60, appears to have priority over var. *minor*, Cann.

Limenitis camilla var. *nigrina* = *nigra*, Entom. xxii. p. 54, the first doubtless earlier. See also *nigra*, Mosl. 1886, without description. The ab. *obliterata*, Shipp, is doubtless the one named *obliterata*, Robs. & Gard.

Chrysophanus phlaeas var. *fasciata*, Ckll. (Entom. xxii. p. 99) is the banded form; var. *fasciata*, Streck., is the corresponding variety of the American race (*hypophlaeas*).

Zygena filipendulae ab. *flava* = *cerinus*, Robs. & Gard. *Z. lavandulae* has a yellow ab. *lutescens* (Entom. xxii. p. 128).

Spilosoma urticae ab. *radiata* was perhaps first named in Entom. xxii. p. 147.

Arctia caia ab. *lutescens*, credited to Tutt, appears to have been first named in Entom., June, 1887, pp. 150-152.

NOTES AND OBSERVATIONS.

PAPILIO DARDANUS var. **LEIGHI**, AND **DANAIS CHRYSIPPUS-DORIPPUS** IN NATAL.—By a slip of the pen in our note on Professor Poulton's remarks in 'Nature' on "Polymorphism in a Group of Mimetic Butterflies" (*antea*, p. 271), we mentioned the assistance given the author by "the late" Mr. C. F. Leigh. We had in mind the late Mr. A. D. Millar, of Durban, and offer our apologies to Mr. Leigh, whose many friends in this country will be glad to hear that not only is he alive and well, but that he is continuing his successful breeding experiments. Under date, September 28th, he writes that "he bred on September 25th the finest example of the *leighi* form of the *Papilio dardanus* that he has yet reared. This specimen—the seventh known to exist—was reared from ova obtained from a variety of the *trophimus* form of the female, and is now in the collection of Mr. D. Longsdon, of London." Mr. Leigh also asks us to announce the occurrence of the *dorippus* form of the female of *Danais chrysippus* in some numbers in and near Durban this season, after not being seen for some years.—(H. R.-B.)

APPARENT AUTUMNAL MIGRATION OF PYRAMEIS ATALANTA.—During the middle and latter part of September, when the settled weather for which we had looked so long came at last, a number of *Pyrameis atalanta* frequented a long bed of China asters in my garden. An attempt by my boy to catch one resulted in a torn hind wing, which served to identify the individual. On the look-out for the particular insect thus marked, I noticed an apparent migration of the butterflies. Thus on September 12th there were two, one with a torn hind wing; on September 13th three; on September 16th the torn one had disappeared, leaving two; on September 17th there were three again, but the torn one was not among them. On the 19th there were three, and one of these had again a torn hind wing, but this was not the same insect that had been previously noted, as the opposite wing was damaged. In two days this also had disappeared. On the following few days four butterflies were seen, but none of them had an injured wing. Then they were reduced to three, increased to four again, reduced to two, and finally disappeared altogether early in October. It seemed, therefore, that a migration was going on which the occurrence of two injured insects enabled one to follow.—(Rev.) W. G. WHITTINGHAM; Knighton Vicarage, Leicester.

OCCURRENCE OF SECOND BROODS OF PYRAMEIS ATALANTA AND P. CARDUI.—In reference to Mr. Carter's note on the abundance of *P. atalanta* larvæ this season in Kent (*antea*, p. 299), I may state that larvæ of this species also occurred very abundantly in this district in June. Some hundred that I collected were full-fed by the beginning of July, and every individual produced a butterfly later. Imagines commenced to emerge July 18th, and by this time larvæ had disappeared from the nettle-beds in the lanes; they were not in evidence again until about September 14th, when they commenced to appear, and by the beginning of October were quite as abundant as in June. At the time of writing this note I have larvæ as small as a quarter of an inch in length, while others are preparing to

pupate. I am quite sure from my own experience that there is a second brood of *P. atalanta*, at least of larvæ, every year, as I have found them in October for the past four years; but in my opinion very few of these late larvæ survive in a state of nature. Two years ago I made experiments with some of these late larvæ. Some were fed in a cage in the open air, and others in an unheated room. Every one of those under the latter conditions fed up and pupated, and the imagines appeared in due course, the last one emerging as late as the end of November; all were exceptionally fine specimens. The larvæ kept out of doors fed much slower, and most of them shrivelled up, as Mr. Carter states happened to those he had. Of the few that did pupate, the imagines formed in every case, but only two emerged, and the wings of these were so deformed as to be useless for flight. The occurrence of *P. cardui* was almost identical with that of *P. atalanta*, excepting that *P. cardui* was not so abundant; larvæ occurred in June, and produced imagines in July, and larvæ again appeared in September. My latest record is of six larvæ, half an inch in length, taken October 9th. It seems natural for these two species of butterfly to go on reproducing their kind and not to hibernate in any stage, so that were it not for the periodical arrival of immigrants, the species would soon become extinct in this country, as the larvæ seem unable to survive the cold. I believe there is no authentic record of either *P. atalanta* or *P. cardui* having been found in hibernation in this country, and the fresh condition of specimens seen in the spring could hardly be possible if they had weathered the vagaries of our English winter.—A. T. POSTANS; Southsea, Portsmouth, October 14th, 1912.

ANARTA MYRTILLI REARED IN JULY FROM JUNE LARVÆ.—I do not know if the following is worth recording. On June 17th I obtained locally twelve larvæ of *A. myrtilli*—some full-fed, others about half-grown. Moths emerged from seven pupæ about the end of July, and yesterday (Oct. 14th) another emerged, whilst the other four are still in the pupal stage. It seems to me that this species must be double-brooded, although I believe most books state that the imago flies in May. There can be no doubt, I think, that the full-fed larvæ I had were from parents which emerged in May, and the fact that seven out of twelve emerged at the end of July really seems to point to the fact that in nature the insect is double-brooded. I shall be interested to notice how the remaining four pupæ fare. What is your opinion on the matter? —G. TALBOT THORNE; 53, Acland Road, Bournemouth, October 15th, 1912.

[It is quite conceivable that, even in the open, *A. myrtilli* may in certain favourable seasons pass through two life cycles during the year. Mr. Thorne's interesting observation is evidence that the species can do this in confinement. The statement has been made that the late as well as the early specimens seen in the same year are alike individuals of one generation, but it would seem to be more probable that specimens on the wing after July are the offspring of parents which were flying in the late spring or early summer of the year. Mr. Thorne notes that he still has four pupæ from the June larvæ. Possibly moths from these may not emerge until next year,

and, if so, this fact would seem to indicate that *A. myrtilli* does not usually attain the imago state twice in the year, although when conditions are suitable it may do so. At the same time it continues to be, in part at least, a one cycle species.—ED.]

LATE EMERGENCE OF APATURA IRIS.—In the February number of the 'Entomologist' (*antea*, p. 79) I reported the emergence of a specimen of *Apatura iris* as a second brood. The other larvæ, with one exception, fed up in a normal manner, the perfect insects emerging last July. One lagged behind the others, and by the time they had pupated it was only about one-third grown. Eventually it changed to a chrysalis on September 1st, and the imago—a very small female—emerged on October 2nd.—EDWARD (GOODWIN; Canon Court, Wateringbury, Maidstone, October 4th, 1912.

PYRAMEIS ATALANTA, ab.—On Sept. 6th my little son captured a fine variety of the above-named butterfly in the rectory garden here. The normal red of the bands on the hind wings is replaced by yellow for a third of the length on the left side, and two-thirds on the right. South, in 'The Butterflies of the British Isles,' p. 81, records that "a specimen with the bands of hind wings marked with yellow has been noted," but I have been unable to trace the reference.—(Rev.) ALFRED T. STIFF; Grantham, Victor Drive, Leigh-on-Sea, Essex.

LEUCANIA UNIPUNCTA IN ISLE OF WIGHT.—On Sept. 7th last, whilst sugaring in the Isle of Wight I took what seemed to be a very unusual looking *L. lithargyria*. By the light of day next morning I was convinced that I had something much better than that common object of the country, and I now find that my capture was a very fine male *L. unipuncta (extranea)*. It was taken at sugar about 8 p.m. on a dull cold night when very few other insects were about.—D. DEWAR; Altyre House, Stanley, R.S.O., Co. Durham, October 21st, 1912.

DASYPOLIA TEMPLI IN LINCOLNSHIRE.—I took a specimen of *Dasypholia templi* at rest on a gas-lamp on the evening of October 10th. This is the first authentic record of its occurrence in Lincolnshire.—G. W. MASON; Barton-on-Humber.

TORTRIX PRONUBANA, Hb.—About the middle of last month I paid a short visit to the spot where the late Mr. G. H. Conquest found *T. pronubana* last year, and having secured the few larvæ and pupæ I required to enable me to complete my own short series and that of a friend, I thought I would see what other food-plants I could find it on. All the above, it should be stated, were on *Euonymus japonicus*. I found, after a long search, two pupæ in spun-together privet-leaves, and one on *Robinia pseudacacia*; in this last instance the larva had spun the last pair of leaflets to the terminal one, forming a covering of a rough triangular outline. Although *Robinia* is well known abroad as one of its very numerous food-plants, I am not aware that the larva of *T. pronubana* has been found on it in this country before. The insect is well established in that part of Essex, and I am quite prepared to find it on this side of the county at any time. It seems perfectly marvellous how this pretty moth has spread about in the past six or seven years, for so conspicuous an insect is hardly likely

to have eluded entomological eyes for any length of time previously. It might be of interest to mention that I found larvæ, pupæ, and imagines (two males) on the same day.—A. THURNALL; Wanstead, Essex, October 1st, 1912.

RETINIA (RHYACIONIA) PURDEYI IN NORFOLK.—The Rev. W. G. Whittingham has very kindly given me two specimens of the *Retinia* mentioned in his article (*antea*, p. 295). These I find are referable to *R. purdeyi*, Durrant, a species quite recently described from specimens captured by Mr. W. Purdey at Folkestone, in Kent, about the third week in July, 1911. The Norfolk specimens were netted, as they flew about pine-trees, in the afternoon of August 20th last.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

ARCTIC DRAGONFLIES.—Mr. W. G. Sheldon was good enough to give me three dragonflies which he took this summer beyond the North Cape—one male *Æschna cærulea* (= *borealis*) and two male *Somatochlora alpestris*. The former occurs, not commonly, in the Highlands of Scotland; the latter is not British, but is found in Switzerland. All the specimens Mr. Sheldon saw were at about sea-level in that latitude. *Somatochlora alpestris* was generally distributed in the Porsanger Fjord wherever there were pools of water. The first specimen was taken at Kolvik on June 27th, and several others of this species were seen there during the ensuing week. At Laxelv, at the southern extremity of this fjord, it was quite common, probably because there were here many pieces of stagnant water. Mr. Sheldon saw examples also at Kistrand on the west and at Børselv on the east side of the fjord. *Æ. cærulea* he saw only at Laxelv—perhaps half a dozen examples in all. They were very wary, and the specimen he gave me was the only one he got a chance at; it was taken on July 13th. He did not see any Odonata at Bossekop, in the Alten Fjord, where he stayed from June 12th to June 28th, nor at Abisko, in Swedish Lapland, at which place he spent from June 16th to July 18th, 1911, although he kept a sharp look-out for them at both these places.—W. J. LUCAS; Kingston-on-Thames.

TENIORHYNCHUS RICHARDII, Fic., IN MIDDLESEX AND HAMPSHIRE.—Two new records can now be added to the short list cited by Mr. F. W. Edwards for this uncommon British mosquito (*antea*, p. 261). That gentleman has been good enough to identify two females collected by myself at Ealing on July 12th and 26th, 1912, respectively. He has also shown me a female which he took at Hook, Hants, on the 17th of the same month, and has kindly permitted me to publish his record with my own.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, September 25th, 1912.

FURTHER RECORDS OF COLIAS EDUSA IN ENGLAND.—On August 28th, at Reading, I captured one male *C. edusa*, and next day saw a female but failed to secure it.—DOUGLAS H. BUTLER; 293, Oxford Road, Reading.

Colias edusa appeared in limited numbers in the clover fields around Chichester on sunny days during July and August. The first specimen, a female, was taken by Mr. Gilbert Humphry on July 24th.—JOSEPH ANDERSON; Alre Villa, Chichester.

PANORPA COGNATA IN SURREY.—On July 4th, 1903, Mr. R. South took at Ockham, Surrey, a male scorpion-fly, which he believed to belong to the scarce species *Panorpa cognata*, Ramb. Mr. K. J. Morton has now been kind enough to examine the specimen, and he informs us that the identification is correct. A female taken by Mr. W. J. Lucas at Byfleet, in the same county, on July 23rd, 1904, has been already recorded (Entom. xliii. p. 187 (1910)).—F. W. and H. CAMPION; 58, Ranelagh Road, Ealing, October 9th, 1912.

NOTE ON PYRAMEIS CARDUI.—On July 2nd, at St. Leonard's-on-Sea, I found several dozen larvæ of *P. cardui*. At the same time worn specimens of the butterfly were on the wing. On July 7th several of the larvæ had pupated; two imagines emerged July 19th and the last emerged July 29th. One specimen has a white spot in the red portion of the wing, two have an additional white spot in the apical region of the fore wing, as mentioned in Barrett's 'Lepidoptera', and one has a black spot in the red portion of the wing.—W. E. BUTLER; Hayling House, Oxford Road, Reading, October 16th, 1912.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *Wednesday, May 1st, 1912.*—Mr. A. H. Jones, Vice-President, in the chair. — The Rev. E. Adrian Woodruffe-Peacock, F.L.S., F.G.S., Cadney Vicarage, Brigg, Lincolnshire, was elected a Fellow of the Society.—Mr. A. H. Jones exhibited three examples of *Aglaia urticae* var. *ichnusa* showing the absence of scales in the centre of the wings, where the central spots are present in the type. Also examples of *Euchloe damone* from Asia Minor and Sicily, showing the difference in the depth of colour of the transverse black streak on fore wings and in the tone of colour of under sides.—Dr. G. B. Longstaff, a series of twelve specimens (five males and seven females) of the rare white butterfly, *Pinacopteryx doxo*, Godart (*venatus*, Butler), from the White Nile. — Mr. Alfred Sich, two specimens, with their cases, of *Coleophora trigeminella*, Fuchs, and one specimen of *C. badiipennella*, Dup., with its case for comparison. — Mr. W. J. Kaye, three small groups of Ithomiine butterflies that had been taken by himself in S. Brazil. — Mr. Hamilton H. Druce, male and female of the new *Mimacræa eltringhami*, captured by Mr. S. A. Neave in the Bugoma Forest, Unyoro, Uganda; also another new *Mimacræa*, which he proposed to name *costleyi*, after its discoverer Mr. Costley-White, at Mlanji, Nyasaland, which appeared to be allied to *M. marshalli*, Trimen, a specimen of which was also shown for comparison. Mr. S. A. Neave described the capture of these specimens. This species in common with several others flies very high, and he said that it was often necessary to employ small native boys perched at the top of the trees and armed with nets.—Mr. A. E. Gibbs exhibited a drawer of butterflies received from Dr. Davis, of Belize, collected in British Honduras and the neighbouring Republic of Guatemala.—Mr. C. B. Williams, a specimen of the male *Megalothrips nobilis*, Bagnall, from Wicken Fen, taken April 11th, 1912. This is the largest European species, and,

since first taken by Dr. Sharp in 1894, has not been recorded.—Mr. S. A. Neave, some of the *Tabanidæ* collected during his recent tour in East Africa, on behalf of the Entomological Research Committee of the Colonial Office. He called attention to the male individuals exhibited, and expressed the opinion that their rarity in collections was perhaps due to the fact that they were short-lived. Mr. G. A. K. Marshall observed that probably many of the Fellows present would hardly realize the importance of Mr. Neave's exhibit. Even amongst the English *Tabanidæ* by no means all the males were known, and this sex was hitherto unknown in the large majority of the species then exhibited.—Mr. R. M. Prideaux brought for exhibition seventeen ova of *G. rhamni* found in a cluster at Brasted Chart, on April 28th, on a shoot of *Ithamnus frangula*.—Professor Poulton said that he had long been struck, especially in the collections of butterflies received from Uganda and British East Africa, with the immense development of mimicry in Lepidoptera from the forest as compared with the open country. It occurred to him that probably this difference was to be accounted for by the difference between the insect-eating animals in these two types of locality, lizards being probably the great vertebrate insect-eaters of the open, birds of the forest. Mr. S. A. Neave said that he had recently had an interesting experience near Entebbe. On January 12th, 1912, at Gabunga's, near Entebbe, he had watched a wagtail, most probably *Motacilla capensis*, catching butterflies on a small patch of damp sand in the bed of a forest stream. The bird was so tame that he stood within three or four yards of it. In less than half an hour this bird captured and ate nineteen butterflies and failed to catch many others. The butterflies eaten were nearly all small *Lycænids*.—Professor Poulton drew attention to a few observations which supported the conclusion that birds possessed the extraordinarily acute and far-reaching vision required by the Batesian and Müllerian theories of mimicry.—The following paper was read: "On the Colour Groups of the Hawaiian Wasps," by Dr. R. C. L. Perkins, M.A., D.Sc., F.Z.S., F.E.S. In illustration of the paper, Prof. Poulton exhibited the specimens referred to by Dr. Perkins. The colour-groups were arranged in the order of the islands, from Kauai in the north-west to Hawaii in the south-east.

Wednesday, June 5th, 1912.—The Rev. F. D. Morice, M.A., President, in the chair.—Mr. Henry Francis Carter, Assistant Lecturer and Demonstrator in Medical and Economic Entomology, Liverpool School of Tropical Medicine, University of Liverpool, was elected a Fellow of the Society.—The President announced that it was requested that for the future the names of intending exhibitors should be handed in at the beginning of the meeting, in order that they might be called upon from the chair.—The Rev. G. Wheeler read the following report of the Committee on Nomenclature:—"The Committee appointed on April 3rd, 1912, to consider the subject of nomenclature, and report to the June meeting with a view to the coming International Congress, has endeavoured to deal carefully and minutely with the matter entrusted by you to its attention. In accordance with the powers conferred on members by resolution of the Society, they added Mr. L. B. Prout to their number after their first meeting. Your Committee probably thus

represented almost every form of divergent opinion on the subject of nomenclature, but nevertheless arrived at a unanimous report which they recommend to the Society for presentation to the International Congress. It will be evident that if these recommendations are adopted by the Society, and the suggestions of the Society by the International Congress, an opportunity will be afforded for putting before the International Committee the different views on matters of detail held by the members of your Committee, or by any other entomologists." The report, which is signed by every member of the Committee, is as follows:—"The present independent and irresponsible methods of giving and adopting names having resulted in much unnecessary synonymy, and even graver abuses, the Entomological Society of London feels that the time has arrived when some check should be placed upon the practice, of more weight than that which can be exercised by any single individual, society, or publication, and would urge upon the International Congress the establishment of a permanent International Committee to deal with questions of nomenclature as affecting Entomology; to consider what elucidations, extensions or emendations, if any, are required in the International Code, and to confer with the International Commission of Zoological Nomenclature. The Entomological Society of London recommends that the International Entomological Committee, when formed, shall take such action as to ensure the adequate representation of Entomology on the International Zoological Commission. The Society also recommends that, considering the difficulty of frequent International meetings, the leading Entomological Society of each country be invited to appoint a Committee, whose duty it shall be to deal with all questions arising in their own country, subject to reference to the International Committee; and suggests that the International Committee be composed of two, or three, members of each of the National Committees, elected either by the Committees, or directly by the electing Societies. (Signed) Chas. O. Waterhouse, Chairman; G. T. Bethune-Baker, T. A. Chapman, Jno. Hartley Durrant, Louis B. Prout, Hy. J. Turner, George Wheeler."

The report was adopted.—Mr. J. E. Collin exhibited a series of thirteen specimens of *Physocephala nigra*, De G., the largest British species of the Conopidæ, caught on Studland Heath (Dorsetshire) during the last week in May, when Colonel Yerbury, Mr. C. J. Wainwright, and himself took some twenty-four specimens; though widely distributed, the species was always considered a great rarity, and its occurrence in such numbers had never before been recorded. — Dr. T. A. Chapman, a specimen of *Hydræcia burrowsi*, Chpn., a new species that has turned up (from Vladivostock) since Mr. Burrows's paper on the group; also a specimen of *L. (Albulina) pheretes*, female, bred at Reigate from the egg, supposed to be the first (and only) bred specimen of the species.—Dr. G. B. Longstaff, two uncommon Sudanese butterflies, *Calopieris eulimene* and *Teracolus pleione*.—Mr. S. A. Neave, some specimens of the Asilid genus *Hyperechia*, representing three, perhaps four, species, all taken during his recent tour in East Africa; also, for comparison, four common species of *Xylocopa*, bees to which the flies bore a marked superficial resemblance; also a remarkable new nymphaline

butterfly, probably belonging to the genus *Pseudacraea*, taken on Mt. Mlanji, Nyasaland. He pointed out that it bore a marvellous superficial resemblance to *Amauris lobengula whytei*, Butler, the Danaine which occurred in the same place. He further exhibited a number of unnamed Lycænids, principally from Uganda.—Mr. H. Main, series of *Pieris napi* and var. *bryoniae*, and pointed out that the latter, reared from ova received both from Lapland and Switzerland, had produced a partial second brood.—Mr. K. G. Blair, larvæ of *Cebrio* sp. (? *gigas*) from Sicily, received from Mr. J. P. Barrett.—Prof. Poulton, the females of two families of *Hypolimnias misippus*, reared in 1911, from female parents of the type form, by Rev. K. St. Aubyn Rogers, M.A., F.E.S., which confirmed the conclusions drawn from his earlier work that *misippus* was dominant and *inaria* recessive. Also the fragments of a *Glossina* identified by Mr. E. E. Austen as a female of *G. caliginea*, Aust.; the specimen had been bitten and rejected by a monkey. He also exhibited several families of butterflies bred by Mr. W. A. Lamborn in the Lagos district, and referred to the strong light which was thrown by them upon different biological problems. Also a specimen of the Eupterotid, or, as Aurivillius considers, the Notodontid moth, *Anaphe infracta*, concerning which Mr. W. A. Lamborn had written from Oni Camp, April 22nd, 1912:—"The moths undoubtedly possess urticating hairs. The female Mona was allowed to steal one. She smelt it, rubbed off the hairs and scales, then dropped it and in a few minutes was rubbing all four feet on the ground. I made some sympathizing remarks with the result that she suddenly sprang on to my bare neck and I have been troubled with skin irritation all the evening." Prof. Poulton said that Mr. A. Hamm had found hairs from the anal tuft of the exhibited specimen produced irritation on his hand and face. Mr. Eltringham had found that the hairs of the female but not of the male tuft were covered with minute, excessively fine spicula-like teeth. Prof. Poulton also exhibited the imagines and cocoons of *Chrysopsycha varia* sent to him by Dr. G. D. H. Carpenter from Damba Island. The larval skin was still projecting from some of the cocoons and showing its blue spots.—Dr. T. A. Chapman remarked that the hairs covering the eggs of *Porthetria dispar* are also urticating. He also observed that there are other species of moths which extrude the larval skin, but in these cases it was from flimsy cocoons. Mr. J. H. Durrant also gave instances of this fact.—Prof. Poulton exhibited the larvæ, pupæ and imagines of "*Callioratis*" *puctolicus*, sent by Dr. G. D. H. Carpenter, to illustrate the warning colours of this Hyspid moth in all its stages. He said that Dr. G. D. H. Carpenter had left Damba in December, 1911, and after spending Christmas at Entebbe had gone in January to Bugalla Island, in the Sesse Archipelago, and had found there representatives of all the *Planema-Pseudacraea* associations. The disproportion between *Planema* and *Pseudacraea* is even greater here, so much so that Sesse confirms the Damba records, the results being still more striking. The following papers were read:—"Studies in the Blattidæ," by R. Shelford, M.A., F.E.S.; "*Polyommatus alexius*, Freyer, a good Species," by T. A. Chapman, M.D., F.Z.S., F.E.S.—GEORGE WHEELER, M.A., *Hon. Secretary*.

OBITUARY.

WILLIAM RICKMAN JEFFREY, who passed away on October 14th last, was born at Ashford, in Kent, in April, 1836. He was the son of J. F. Jeffrey, a member of the Society of Friends. In 1845 he was sent to a boarding school at Croydon and often recalled the bitter winter day, when as a small boy he travelled by the South Eastern Railway (not then opened to Dover) in an exposed carriage without a roof! His health being somewhat delicate, he left school in 1848, and the next three years he spent at Folkestone, where, often roaming over the then much less frequented Warren, he caught butterflies, &c., and acquired that taste for the pursuit of Natural History which he followed throughout his life.

In 1851 he was apprenticed to the late Thomas Nickalls, watch-maker, at Reigate. Here it was his good fortune to receive the kindly notice of the late H. T. Stainton, in the early days of the 'Intelligencer'; when our great and genial lepidopterist frequently came to Reigate overnight, and rising next morning before the people at the hotel were about, he pursued his practical field work in the early morning hours, returning to London in time to superintend the publishing of his weekly and other works. These pleasant hours before business were much valued by W. R. Jeffrey, when invited to join in the rambles; and were often recalled in the correspondence which followed in after years.

In 1857 he was at Scarborough, where the late Thomas Wilkinson was then working out the life-histories of some of the micro-lepidoptera. After a few years spent at Scarborough, and at Guisboro', and afterwards at Saffron-Walden, he returned to his native place, Ashford, Kent. Here life-histories of several of the Pyrales were worked out, in conjunction with the late William Buckler, with whom he was in frequent correspondence. Readers of Buckler's 'Larvæ' will find Jeffrey's name frequently mentioned in that work. Mr. Buckler was so much excited by the emergence of an imago of *H. stagnata*, that he sent a telegram (which was amusingly hashed in transit) announcing that it was out.

In 1876 he met with a specimen of *Pachetra leucophaea*, which afterwards led to the taking of a number of that species, so that it is now represented in most collections. (First notice in the 'Intelligencer' for April 18th, 1857, when at Reigate.) Whilst at Scarborough the larva of *Dasypolia templi* was discovered, and at Saffron-Walden that of *Gelechia atrella* in May 1866.

At Ashford he was one of the first to find the larva of *Hypercallia christiennella*. W. R. Jeffrey also turned his attention to the Coleoptera, and had a good collection of beetles. He was also an ardent botanist; of late years the study of the Cryptogams took much of his spare time, and he had many long rambles in his search for mosses, liverworts, and fungi. One of his two sons is Curator of the Herbarium at the Royal Botanic Garden, Edinburgh. He leaves a widow, two sons, and three daughters. He was gathered to his people, at the Friends' burial ground at Kennington, near Ashford, on October 16th.—C. V.

THE ENTOMOLOGIST

VOL. XLV.]

DECEMBER, 1912.

[No. 595

EREBIA MELAMPUS, FUESSL., IN CENTRAL FRANCE, AND A NOTE ON *E. EPIPHRON* var. *CASSIOPE*, FABR.

BY H. ROWLAND-BROWN, M.A., F.E.S.

WHILE overhauling my this year's captures at Brenner, and transferring the *Erebias* to the cabinet, I observed among an extended series of *Erebia epiphron* var. *cassiope* from the Central Alps, Pyrenees, &c., two unmistakable males of *E. melampus*, taken by me on the Plomb du Cantal on July 31st, 1909 (cp. "Butterflies of Cantal and Lozère," Entom. xlii. p. 267). Apparently this butterfly has never before been recorded from the volcanic regions of Central France, though the higher mountain slopes, where not grazed too closely by cattle, are affected by some other members of the genus. M. Oberthür ('Lépid. Comparée,' fasc. iii. p. 288) tells us that *melampus* is absent from the Pyrenees, despite Staudinger's assertion to the contrary (as quoted by Mr. H. J. Elwes in his "Butterflies of the French Pyrenees" *), and neither I nor the many English entomologists who have explored the range more recently have come across it. Staudinger, in fact, only repeats the brothers Speyer ('Schmett. Deutsch u. der Schweiz,' p. 94), who themselves copied a previous erroneous report. Meanwhile, also, both Guenée and Sand overlooked *melampus* at Le Lioran, nor is it included in Guillemot's 'Catalogue des Lépid. du Puy-de-Dôme,' and it would be as well, therefore, for collectors in Auvergne to keep a sharp look-out for the species. *Erebia œme* was discovered by Bellier de la Chavignerie in the Forez Mountains, somewhat south-east of the Pierre-sur-Haute (5380 ft.), the furthest-west locality ascertained. But no one to my knowledge has since hunted in the beautiful hills that watch over the valley of the Dore, and the noblest of Benedictine Abbeys, La Chaise Dieu. At sufficient altitudes hereabouts *melampus* may precede its larger congener, for *œme* is usually over before it is on the wing. The dry mountains of the southern Cévennes and Lozère, however, are less suggestive of missing links in the "life line" of the species.

* Trans. Ent. Soc. Lond. 1887, p. 396.

WHAT IS *EREBIA EPIPHRON* VAR. *CASSIOPE*, Fabr.?

While on this subject, I should like to draw the attention of British lepidopterists to M. Charles Oberthür's remarks (*loc. cit.* pp. 284-88) on the relation of *Erebia epiphron*, Knoch, to its so-called variety *cassiope*, Fabricius.

"In what respect," he asks, "does it actually differ from *cassiope*? According to Staudinger and Rebel, because of the extracellular (antemarginal) rusty band, and the white-pupilled black eye-spots in the female *epiphron*; in *cassiope* the eye-spots are blind, and the rusty bands obsolete; but on the same mountains are found examples of *epiphron* and *cassiope*. *Epiphron*, then, only designates one local race as *cassiope* designates another. There may be localities where *cassiope* predominates, *e.g.* the Grisons; but I think *cassiope* is to be found in all places where *epiphron* exists, and *vice versa*."*

British *epiphron*, he continues (note they are called by the type name), are relatively large. . . . They most resemble the form of the Vosges (which, by the way, is a reputed headquarters of the type), in that each black eye-spot in the antemarginal series of the fore wings is surrounded by a sort of reddish brown circle (this suggests *mnemon*, Haw.), instead of being placed in the middle of a reddish brown band, the exterior contours of which are irregular, and do not form a ring. In the classification of the form *cassiope*, then, should we not denominate it rather as var. et ab., or even only ab. of *epiphron*? Or does the male *cassiope* in its numerous forms differ so materially from the male *epiphron* as to entitle it to varietal rank at all? M. Oberthür suggests that it does *not* differ so materially; and if, as he says, and I have found to be the case, the female with the unpupilled ocellations occurs on the same ground as the female with the white-pupilled eye-spots, would it not be more correct to describe the "unpupilled" *cassiope* as *epiphron* var. et ab. female *cassiope* only?

In this connection the genesis of the names *epiphron* and *cassiope* is exceedingly interesting. Knoch ('Beiträge,' iii. p. 178), without differentiating the sexual forms, is emphatic:—"Alæ superiores ante ocellis duobus, seu pluribus sæpius maculis tantum vel punctis nigris; post eadem ratio. Inferiores supra ocellos tres infra totidem plures(q)ue seu maculas exhibent."

But, on turning to the beautifully executed figure of the butterfly, tab. vi. fig. 7, it will at once be seen that the figure is

* For example, Mr. B. C. S. Warren, collecting with me in the mountains above Eaux Bonnes in the western Pyrenees in July, 1911, took one of these white-pupilled females of "*cassiope*"; but all others seen or captured by us were of the usual form (*cp.* Entom. vol. xlv. p. 337); and in the British Museum there is another similar female from the Leach collection among the others taken by Sir George Hampson on the mountains above Luchon.

that of a female white-pupilled on all the wings, and therefore typical female *epiphron*; in fact, I think, in all authors down to a comparatively recent period, wherever *epiphron* is figured, this female of Knoch's is copied and adapted (?) to the male. Thus we find Godart and Duponchel ('Diurnes,' vol. ii. pl. xvi. figs. 3-4) figuring both male and female studded with silvery-white spots on the rufous bands of both wings, and the examples are as large in size as *E. ceto* at least. Nor does the text suggest the absence of the white pupils in the male: "La bande des premières ailes offre de deux à quatre yeux noirs à prunelle blanche."

Herrich Schaeffer figures the male *epiphron* with continuous antemarginal bands on all the wings filled with white-pupilled spots (Schmett. von Europa. pl. xx. figs. 92, 93); but he shows us no more than the under side of the female (fig. 94) with the spots on the abbreviated ante-marginal band of the hind wings only pupilled white. Spuler, also (Schmett. Europas. 1910, pl. ix. fig. 7), figures the male *epiphron*, curiously enough ignoring the typical female altogether as well as both sexes of *cassiope*; and there is nothing in his figure to distinguish it from such male *cassiope* as one may take in the Scotch mountains; at all events, in my copy of this work I can detect no white pupilling of the eye-spots; and I say "curiously," because it seems strange that in a German work of the kind, the female, which should be the characteristic German (Harz and Vosges) *epiphron*, is omitted altogether. Dr. Seitz, however, illustrates both sexes, and in my opinion correctly: the female with white pupils to the eyes, the male with none. Lang, also, figures the male only ('Butterflies of Europe,' pl. lviii. fig. 1); nor does he insist in the text on the white pupils as a sexual character of the female type form alone, but implies, apparently, that these may occur in both sexes.

I have carefully gone through the series of *epiphron* and its forms in the National Collection at South Kensington, including the soi-disant var. *cassiope*, and not until I arrived at Mr. H. J. Elwes's var. *rhodopensis* from the Balkan Rilo Dag (6500 ft.), could I detect a trace of white pupillation in a single male. In this variety, which is more strongly reminiscent of *E. medusa* by the brilliance of the ocellation in the female, there are males with two tiny apical ocellations on the fore wings, and a smaller pair nearest the costal margin of the hind wings distinctly white-pupilled. On the other hand, none of the males from the Harz and the Silesian Alps, or the Vosges (with white-pupilled females in each case) show a trace of white, so that we may fairly conclude that the typical male *epiphron*, known to entomologists who have more than a book knowledge of the species, is a *plain black spotted form*, and that Staudinger is right in his short diagnosis limiting the white pupilled form to the female . . . "*fascia (maculis) extrema rufa ocellis (♀) albopunctatis.*"

I do not think many British entomologists, however, will

agree with his version of var. *cassiope*: "maculis rufis obsoletis, ocellis nigris cæcis" (unless he means to imply that the band is simply broken up). We have always regarded our insular forms as *cassiope*, but of the number met with how many can be said to have the band on the fore wings entirely obsolete? A very small percentage, I think; and these in any case referable either to var. (et ab.) *nelamus*, Bsdv., or Tutt's more complete ab. *obsoleta*.

Mr. Wheeler ('Butterflies of Switzerland,' p. 123) describes *cassiope* as differing from the type in that the fulvous band on the upper side of the hind wings is replaced by three or four black dots in fulvous rings, which corresponds more with Fabricius's description, but not with Staudinger's. But, though he does not say so, I gather that he also, when he was writing on the subject, regarded the male *epiphron* as white-pupilled, the male *cassiope* as lacking these eye-spots.

Meanwhile, Fabricius, who is cited as the author of the name *cassiope* ('Mantissa Insectorum,' 1787), gives us a description totally at variance with Staudinger's conclusions:—

"Alis integris fuscis; fascia rufa; punctis tribus ocellaribus nigris, posticis subtus punctis solis.

"*Habitat in Austriæ Gramine Dom. Schieffermyler*" (sic).

The italics are my own, for I think from what follows, and from Fabricius's limitation of *cassiope* to the Austrian Alps (?), that he may have meant a different insect altogether. "*Precedenti affinis at paullo minor*," he says. But the preceding species is not, as one might expect, *epiphron*; it is *pyrrha*, F. (= *manto*, Esp.); and I think that any one acquainted with the smaller forms of *manto* transitional to var. *pyrrhula*, Frey, which occurs in the Austrian Tyrol, and generally in the higher alps of the East, would not find it hard to square Fabricius's *cassiope* with some forms of that extremely variable species (cp. Mr. Lowe's remarks on *Erebia manto*, and its Varieties, *antea*, p. 145).

Dr. F. J. Buckell, who deals with the subject at some length in his admirable study of 'Erebia Epiphron and its Named Varieties' (Ent. Record, vol. v. pp. 161-165), hazards no suggestion of this possibility. He does not mention the fact that Fabricius associated his *cassiope* with *manto*—the type form of which butterfly is surely so entirely different in appearance, and everything else—habits and flight—from our "Small Mountain Ringlet." For whereas in my experience *cassiope* is on the move only when the sun is shining, *manto* will fly even on the greyest days. Dr. Buckell may, indeed, have been unacquainted with the forms of *manto* in the eastern alps.

We know, then, what we mean by *cassiope* in Britain and Ireland. What we want to make sure of is what Continental authors and collectors mean by male *epiphron* in contradistinction to the male of the so-called variety.

THE LEPIDOPTERA OF THE NORWEGIAN PROVINCES OF ODALEN AND FINMARK.

By W. G. SHELDON, F.E.S.

(Continued from p. 315.)

FROM July 18th I spent five days at Kistrand, the principal village in the district, and the residence of the only clergyman, doctor, and herdsman in the Porsanger Fjord. I found excellent quarters with Herr Lillebo, the local merchant. Schöyen, in 1879, captured here some examples of the very rare *Brenthis chariclea*, flying in swampy meadows with *B. pales*. The first four days of my stay the sun did not appear, but on July 23rd it shone brilliantly; *B. pales* on this day was not uncommon, but the rarer species could not be turned up. On the evening of this day I left, with much regret, the most interesting Porsanger district, and, travelling in the local steamer to Hornigsvaag, the next day boarded the mail boat there, in a perfect hurricane. Fortunately the passage is partly sheltered by islands, and thus we did not get the full effect of the storm, but what we did get was more than sufficient for almost the whole of the passengers.

On my return journey I stayed three days at Tromsø, chiefly to see the Museum, but partly also to do some collecting. Unfortunately the sun did not shine during my stay, and consequently I did not see there a single butterfly.

From Tromsø I travelled direct to Trondhjem, at which port I booked a passage to England on the Hull boat.

I suppose the weather during my stay within the Arctic Circle was about an average of what is to be found there in June and July, and certainly it was much better than what I experienced in 1911 in one respect—the number of perfect days enjoyed; though in other ways there was not much difference in the two years. On turning up my diaries I find that in 1911 I spent thirty-three days in Lapland; out of these only two were cloudless. On twenty there was more or less broken sunshine, and on eleven the sun did not break through the clouds. This year I was in Finmarken forty-two days, of which fifteen were perfect, ten not perfect, and seventeen cloudy throughout; unfortunately, five of the perfect days were wasted—from a lepidopterist's point of view—by my having to travel on them from Bossekop to Kolvik, a distance as the crow flies of about fifty miles, but through swamps, over mountains, and through roadless, uninhabited, and impossible country.

In addition to the Porsanger there are three other fjords in Arctic Norway east of the North Cape; of these the most easterly, the Varanger Fjord, is well known entomologically, but the other two, the Laxe and Tana Fjords, have, I believe,

never been explored for Lepidoptera. I understand there is accommodation to be found in both of them, and I was informed at Kistrand, by Pastor Astrup, that the vegetation is even more luxuriant there than is the case in the Porsanger Fjord.

Mosquitoes were not much in evidence at Bossekop, Kolvik, and Kistrand, but at Laxelv they were in countless millions in the forest, and my experience there was the worst I have ever had to put up with in this respect.

The utter impossibility of accurately forecasting the date on which one should be on the collecting ground in Arctic Scandinavia was strikingly exemplified by my receiving a letter from Herr Sparre Schneider, which was written in May, and in which he stated that the season at Tromsø promised to be an early one, whereas when I got to Bossekop in early June, I found that in consequence of a cold spell everything was very backward and the season a late one.

I had a good opportunity of testing the effect of the perpetual daylight upon the flight times of Lepidoptera, and the result of my observations was that I found the Diurni were not on the wing before 8 a.m. and that the flight was practically stopped by 4 o'clock in the afternoon. I was out at 6 a.m. on several bright sunny mornings, but although an occasional *Erebia lappona*, or *Æneis norna* was to be kicked up between 7 o'clock and 8 o'clock, they did not fly of their own accord until the latter hour. The Geometræ flew fairly freely in the afternoon, but their natural flight time was from 6 p.m. to midnight and after. It was very striking to see a large Geometer such as *Gnophos sordaria*, a species resembling our *G. obfuscata*, flying gently in the full light at midnight, depositing ova. The Nocturæ I saw consisted mostly of Anartas. These flew in the bright sunlight of mid-day. But the same habit obtained in the other species I came across, including *Plusia hohenwarthi*, and *Pachnobia hyperborea*.

The species of Lepidoptera I met with in Finmark are as follows:—

Pieris napi.—This species was rare at Bossekop; perhaps it was not fully out, for it is usually abundant there. It was not uncommon at Kolvik. The chief characteristic of the Northern Scandinavian *P. napi* appears to be the profusion of dark shading on the veins on the under side of all the wings, more especially on the inferiors. This tendency culminates in certain of the males, in which the shading on the veins almost covers the inferiors, and on all wings terminates on the outer margins in broad wedges, not gradually tapering to a point, as is the case in Central European forms. This extreme form, of which I have examples from Bossekop and Kolvik, and also from Abisko in Swedish Lapland, is figured on Plate xiv., fig. 4, and I propose for it the name *arctica*, n. ab. The females, which are of course all var. *bryonia*, have a strong tendency to ochreous, especially on the under side of the inferiors.

As far as I could ascertain, the food-plant in Finmark is *Draba incana*, which is almost the only crucifer I came across there.

Colias hecla.—This most beautiful species was apparently not out at the time of my visit to Bossekop, where previous observers had found it not uncommon. I was fortunate enough, however, to come across it in great abundance in the open meadows lying on both sides of the river at Laxelv (see Plate xi.), flying swiftly with the customary *Colias* flight and often settling on and sucking at the flowers of *Astragalus alpinus*, which to my surprise I found to be the food-plant of the larva, and which thus in addition furnishes the imago with sustenance. It will be remembered that last year I found the food-plant of the other arctic species of this genus *C. nastes* at Abisko to be *A. alpinus* also. The imago, especially the male, by its swift low flight amongst the plants of *Vaccinium*, *Empetrum*, &c., which grow in its habitat, soon gets damaged, and on the day on which I first came across it, July 11th, I had to exercise a good deal of selection to get good specimens. Ova were plentiful, and I now have larvæ hibernating in the third stage.

The series of about one hundred examples I brought home is a very variable one; the males vary in size from 42–50 mm., and the females from 44–54 mm.

On looking over the European series in the National Collection I find that a few of the males have a rosy suffusion on the upper sides of all the wings, similar to that which is found in some male *Colias edusa*; in my series fully seventy-five per cent. have this rosy suffusion, which is very pronounced and beautiful in some specimens; for this form I propose the name *rosea*, n. ab. The ground colour of the male varies very much, the majority are of a rich red orange, but a few are of a much lighter orange tint, not darker than in typical *C. edusa*, whilst one example has the entire upper side of the brown colour of typical male *C. heldreichi*, the darker margins being brown, also of a darker tint; this specimen is, however, not freshly emerged, and one suspects abnormal conditions after emergence have caused what is certainly a remarkable form.

There is a tendency in some of the males for the light veins crossing the dark margins to be reduced in number and distinctness, some specimens being entirely without them; there are examples in the National Collection of this form labelled Kvickjock, and Lapland; a suitable name for it appears to be ab. *suppressa*, n. ab. Professor Aurivillius who is responsible for the European specimens being named var. *subitelmæ*, has only described the female as "above rather more vivid in tint, brown or sometimes rose-flushed, much less suffused with black." He does not mention some of the most characteristic features of this sex, for instance, the prominent light blotches in the dark marginal band, described by Lefebvre in 'Annales de la Société Entomologique de France,' tome v., p. 386—the original description of *C. hecla*—to be seven in number in the front, and four on the hind wings, and therefore one can only assume that as Aurivillius does not distinguish var. *subitelmæ* from the type in this respect, he did not notice the difference. My Porsanger examples have almost all seven pale blotches on the superiors, though one has six, and another only five; but the whole of them have six blotches

on the inferiors, and I find that almost all the European examples in the National Collection are of this form, which one must therefore conclude should be the typical European form in this respect. Lefebvre's specimens, which he states came from Iceland—where we now know *C. hecla* does not occur—were no doubt from Arctic America, judging by the figures. The variation of the hind wings in my specimens takes two forms, one is the extra distinctness of the blotches, and this is emphasized in those specimens which have an extra dark marginal band, or dark ground colour to the wings. This form I have figured on Plate xiii., figs. 5 and 7, and propose for it the name *distincta*, n. ab. In the other form the lower four blotches are suffused with the ochreous ground colour of the wings, and they thus become much less distinct; for this form (see Plate xiii., fig. 6) I propose the name *ochrea-suffusa*, n. ab.

A few of my females have the base of the superiors with dark suffusion; there are specimens of this form in the National Collection, a suitable name for which appears to be *obscura*, n. ab. (see Plate xiii., fig. 8). There is a good deal of variation in both sexes in the shape and size of the discoidal spot in the centre of the superiors; in the males in some cases it is a narrow line, in others it is as broad as it is long. Lefebvre describes and figures this spot in the female "with an orange centre"; my specimens generally agree with this, but in about ten per cent. the orange centre is wanting, which thus might be called *nigropunctata*, n. ab.

Rumicia phleas, var. *hypophleas*.—This fine form I had expected to meet with freely, but only saw two males, both of which were captured at Laxelv; one of them is ab. *ceruleopunctata*.

Polyommatus optilete.—Abundant at Laxelv. Amongst *Vaccinium*.

Aglais urticae.—The only larvæ I saw were a colony at Børselv, which I managed to bring home as pupæ; these emerged in the middle of August as fine dark examples, not, however, so strongly banded as some I obtained at Abisko last year; they were, of course, all tending towards var. *polaris*.

Brenthis pales, var. *lapponica*.—Fairly common at Laxelv and Kistrand, but not so abundant as I expected to find it.

B. freija.—Not infrequent at Bossekop, and in good condition. In the Porsanger Fjord it was not common; I saw one or two worn examples at Børselv on July 7th, and perhaps half a dozen others a week later at Laxelv.

(To be continued.)

BY THE WAY.

WE have read with such attention as it deserves the proposal of the Entomological Society—as Verrall said, being the oldest Society of the kind it lacks all need for the minimising appange "of London"—to the infant International Congress of Entomology, respecting priority of nomenclature; and we have

no hesitation in asserting that nothing short of an appeal to the Hague Tribunal will bring about the effect they desire. Edward Saunders discarded *Cyllocoris flavoquadrimaculatus*, De Geer, because it was too long a specific name. We are inclined to add *sic*; but each author is, at least for the nonce, a law unto himself (unless he is suffering from an editor). Moreover, the present system is inconsistent: it admits such generic terms as *Piezodorus*, *Tropicoris*, and *Acetropis*, but rejects individuality to Prof. Westwood's memory by writing *westwoodii*—this is surely but a step short of rendering the name *occidentalisilvæ*! Entomological topics have become too specialized to often be of wide interest, and we think nomenclature in all its aspects that most fitted for general discussion, utterly bootless though it be.

A contemporary publishes some elucidation of the cause of the "humming in the air" so often heard on summer days, for which Gilbert White and later authors have lacked an explanation. That it is caused by dancing Chironomi shortly before dusk is true enough; but it is not confined to that hour, and Mr. J. E. Collin is of opinion that the facts stated cover but part of the ground necessary to clear up the whole mystery. The humming is a very well-known phenomenon, and the author of 'The Caxtons' has turned it to a philosophical simile in 'Kenelm Chillingly' (1873, i. 320) thus:—"I declare I know no more why the minds of human beings should be so restlessly agitated about things which, as most of them own, give more pain than pleasure, than I understand why that swarm of gnats, which has such a very short time to live, does not give itself a moment's repose, but goes up and down, rising and falling as if it were on a seesaw, and making as much noise about its insignificant alternations of ascent and descent, as if it were the hum of men." The devotee would answer with our author—

"It is thou who art shoreless on every side,
And thy width will not let thee enclose content."

C. M.

NOTES AND OBSERVATIONS.

MORTALITY AMONG DELPHAX (ARÆOPUS) PULCHELLA, Curt.—The larvæ of this species of homopteron were in countless thousands at the base of reeds and on the moist mud between them in Covehithe Broad, on the Suffolk coast, last July, and the younger, less agile ones appeared to form the staple food of every carnivorous insect there. I saw neither *Pæderus fuscipes* nor *Coccinella 19-punctata* actually prey upon it, but *Bembidrum*, *Nabis*, and a micropterous Alysiid (closely allied to *Allæa contracta*, Hal.) certainly did so, for in one or two places, where the base of the reeds had grown circularly

together, forming a kind of chamber above the mud—a place where the saltatory powers of *Delphax* would be of little avail for escape—were great numbers of their sucked skins with gorged individuals of those species; the Alysiid, however, was more probably in search of a dipterous victim, for no males were apparent. The mortality must be very great and the oviposition of the survivors prolific, for in September perfect *Delphax*, though not rare, are only in their tens where now the larvæ are in their thousands. I fancy other *Coccinellæ* must attack them too, for both *Micraspis 16-punctata* and *C. 11-punctata* were common, though I saw with careful searching but a single specimen of an Aphid, which was a winged *Hyalopterus arundinis*, Fab.—CLAUDE MORLEY.

ON THE HABITS OF PARYDROPTERA DISCOMYZINA, Collin (MS.) In the middle of September, 1910, two specimens of this new dipteran occurred to me in a salt-marsh at Southwold; this was just before dusk. Accordingly at dusk I searched for the species at the same spot on several subsequent occasions, but with no success till the 17th of last July, when four examples were secured, with several the next day. These were only aroused from the salt-marsh plants (*Aster*, *Sueda*, *Spergularia*, *Atriplex*, &c.) by smoke; then they would jump from the mud level to about an inch up the pressed-back herbage, and great care was necessary in bottling or a second leap was made—usually downwards, though the insect invariably headed upward. This frequently led to loss, as it was usually effected through some aperture in the stalks and the fly lost to sight; nor was it often again aroused, even by smoke. Thus I lost nearly half those seen. The appearance when alive is that of a shining and peculiarly convex *Salda*, for the wings are pressed flat to its back and apically deflexed; and the saltatory powers are very similar in degree. This time it occurred in the same salt-marsh as formerly, though some hundred yards from the original spot, where a diligent search failed to reveal it. In both situations it was found on ground just too wet to lie upon (though I did!), and yet by no means covered with water; so salt was this that sand-hoppers and whelks kept *Parydroptera* company. In all I secured some two dozen examples with three hours' close work.—CLAUDE MORLEY; Monk's Soham House, Suffolk.

THE ADAMS COLLECTION OF LEPIDOPTERA.—This exceedingly rich and very extensive collection of Lepidoptera is now installed in the Natural History Museum at South Kensington. It is contained in sixty-eight cabinets and numerous store-boxes. The number of specimens probably totals something like one hundred and fifty thousand, among which are hundreds of types.

THE SUFFERT COLLECTION OF BUTTERFLIES.—The large collection of African butterflies, with its numerous types, formed by the late Herr E. Suffert, of Berlin, has passed into the Joicey Collection. Entomologists are invited to compare their specimens with the types.—J. J. JOICEY; The Hill, Witley, Surrey.

COLIAS EDUSA IN NORTH DEVON.—On August 20th, 1912, as my wife and I were walking along the road from Northam to Appledore,

a fine specimen of *Colias edusa* flew over a gate into the road, but escaped before I could get out my net, which had just previously been placed under my rainproof coat during one of the many showers which fell on that day.—C. GRANVILLE CLUTTERBUCK; 23, Heathville Road, Gloucester, November 8th, 1912.

COLIAS EDUSA, &c., IN NORTH DEVON.—I arrived here on the 8th inst. On the 9th *Colias edusa* was seen, and a full-grown larva of *Sphinx ligustri* taken at Torrington. On the same day a fresh-looking *Epinephela ianira* was seen, and numbers of *Pyrameis atalanta* and *Plusia gamma*, a few *Vanessa urticae* and one *V. io* were noticed flying around and settling on various clumps of *Michaelmas daisy* in the gardens. On the 11th three *C. edusa* were seen at Tawstock, near Barnstaple, and several *Pararge egeria* in the lanes. Sugar was tried that evening, but was only visited by one *Phlogophora meticulosa*, and one *Amathes pistacina*. On the 12th a bright male *edusa* was captured in the garden, and great numbers of *P. gamma* were flying at dusk among flowers of *Antirrhinum*. On the 17th several *Pieris brassicae* and *P. rapae* were seen at Ilfracombe. Sugar was tried again on the night of the 19th, and single specimens of *Agrotis saucia*, *Lithophane socia*, and *Graptolitha ornithopus* were taken, and several *Agrotis suffusa* and *P. meticulosa* were seen. On the 25th my wife caught a light-coloured *edusa* in her hand in a road close to the house. It was very feeble and worn, so she let it go. It was probably a female. There has been a lot of rain and gales of wind lately and the nights have been too cold for sugar or ivy. If the weather had been brighter and warmer in September and during this month, I believe it would have been a record year for *edusa* in this neighbourhood.—GERVASE F. MATHEW; Instow, North Devon, October 30th, 1912.

COLIAS EDUSA, PYRAMEIS ATALANTA, AND P. CARDUI IN WILTS.—I saw one *C. edusa* male on Sept. 7th, the first I have seen during the eleven years I have been here. The larvæ of *Pyrameis atalanta* have been abundant, and with them I found two larvæ of *P. cardui*, also feeding on nettle. I did not recognize that the two were not *P. atalanta* larvæ until they changed to chrysalids. All the larvæ were taken in August and September, *P. atalanta* emerging from August 30th to October 18th; the first *P. cardui* on August 31st, and the other on October 7th.—(Rev.) C. A. SLADEN; Alton Barnes Rectory, Pewsey, Wilts, November 1st, 1912.

PYRAMEIS ATALANTA.—On June 19th I found a larva of the above nearly full grown; it pupated on June 24th and the butterfly emerged on July 10th. One full-fed larva obtained on September 8th pupated on September 12th, and the imago emerged October 2nd.—W. E. BUTLER.

AGROTIS HYPERBOREA (ALPINA), &c., IN PERTHSHIRE.—On August 5th I took a worn female specimen of *Agrotis hyperborea* at rest on crowberry on a spur of Schiehallion. The capture of the imago seems to be somewhat unusual, but it was still more unusual to find a few fresh females of *Argynnis aglaia* on the wing within two or

three hundred feet of the crowberry line some minutes later.—C. MELLOWS; The College, Bishop's Stortford.

EUROIS OCCULTA AND COSMIA PALEACEA IN YORKSHIRE.—This species is in its old York habitat this year. One specimen came to sugar on the night of July 24th. Mr. Walker tells me that the species had not been seen in the locality for several years. *C. paleacea* was very abundant at sugar the same night.—C. MELLOWS.

FURTHER ADDITIONS TO THE GLOUCESTERSHIRE LIST OF LEPIDOPTERA.—Thanks to Mr. E. Meyrick's kindness in identifying the specimens I am able to add the following species to our county list:—*Mompha (Laverna) lacteella*, "curious abnormal dark form, the whitish ochreous area obscured by dark fuscous suffusion," taken on March 28th and April 9th, 1912, on the window of a railway station on the outskirts of the Forest of Dean; *Aristotelia (Doryphora) pulveratella*, taken on the Cotswolds on April 25th, 1912, flying in the afternoon; and *Coleophora deauratella*, also taken on the wing in the afternoon sunshine near Gloucester on May 19th, 1912.—C. GRANVILLE CLUTTERBUCK; 23, Heathville Road, Gloucester, November 8th, 1912.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, October 2nd, 1912.—The Rev. F. D. Morice, M.A., President, in the chair.—Miss Lily Huie, Hollywood, Colinton Road, Edinburgh, was elected a Fellow of the Society.—The death was announced of the Hon. Fellow, Prof. L. Ganglbauer, of Vienna, and also of Messrs. R. Shelford, M.A., F.Z.S.; E. A. Fitch, F.L.S.; and G. H. Grosvenor, M.A.—Dr. Nicholson showed three specimens of *Adalia obliterata*, L., ab. *sublineata*, Weise, an aberration not as yet recorded from Britain.—Mr. G. T. Porritt, various forms of the variety *nigrosparsata*, together with the type specimen of the var. *nigra* of *Abraxas grossulariata*, all bred from larvæ and pupæ collected from one garden at Huddersfield during the present year.—Commander J. J. Walker, series of the following rare species of British Coleoptera, recently taken in the Oxford district:—*Lathrobium pallidum*, Nord.; *Apion annulipes*, Wenck., male and female; and *Psylliodes luteola*, Müll. Also a specimen of the so-called "insect-catching grass" (*Cenchrus australis*), from Cairns, N. Queensland, with several Coleoptera, belonging to various genera, adhering to the spinous awns.—Mr. R. M. Prideaux, a beautiful aberration of *P. cardui*, closely resembling one figured by Newman.—Mr. C. J. Gahan, a small series of *Phrommia superba*, Melich, a dimorphic species of Homoptera of the subfamily *Flatinae*, taken by Dr. A. C. Parsons in Northern Nigeria, and read a letter received from Dr. Parsons to explain the great interest attaching to the specimens.—Mr. W. A. Lamborn, a series of twelve Homoptera of the genus *Flata*, all taken feeding on one plant, seventy miles east of Lagos, on December 1st, 1911. The insects were dimorphic, and he stated that the pink and green forms were mixed as they rested on the plant.—Prof. Poulton,

an apparently uninjured example of *E. jacobæ* given him by Mr. Roland Trimen, F.R.S. The moth was flying slowly at midday in his garden at Woking, when a robin captured it on the wing and flew with it behind a bush. After about three minutes the bird flew away, and Mr. Trimen found the moth lying upon the ground.—Dr. T. A. Chapman, several unusual forms of some common “blues” taken this year in the Valley of the Isère and at Courmayeur. He said that the “blues” of this region are generally large and more than usually variable; and that it is also the headquarters in Western Europe of *Agriades alexius*, Frr.—Mr. Donisthorpe, a number of males of *Ponera coarctata* which he had swept at Box Hill, and remarked that no one living appeared to have taken males in Britain. Also males, females, and workers of *Formicorexus nitidulus*, taken in a nest of *P. rufa* at Weybridge. Also males, females, and workers of *Leptothorax tubero-affinis*, a form new to Britain. Also a male, and winged and dealated females of *Anergates atratulus*, which lives in the nests of *Tetramorium cespitum*.—Mr. Hy. J. Turner, on behalf of the Rev. C. R. N. Burrows, a long series of bred *Celastrina argiolus*. He stated that the larvæ had occurred each year for some time past in the garden at Mucking, feeding on Portugal laurel, attacking the flower buds in the early summer. The whole of the specimens were unusually large. Many of the females had a strong development of whitey-blue on the basal half of the costal area, and there was a tendency to develop a whitish suffusion in the discal area of the fore wing. The form closely resembled the Nearctic form *pscudargiolus*. He believed that the food-plant had not hitherto been recorded. He also exhibited a curious colour-print of an “Entomologist,” published in 1830 in London, in which the whole of the figure was ingeniously made up of various species of the Insecta, only the face being human.—Mr. L. W. Newman, specimens of *Dianthæcia*, bred from North Kent wild larvæ, resembling exactly, both in size and coloration, *Dianthæcia capsophila* from the Isle of Man. This appeared to confirm the opinion of several leading men that *D. capsophila* and *D. carpophaga* are the same species. He also showed for comparison varied series of *D. carpophaga*; a pair of *D. capsophila* and *D. capsincola*.—Mr. W. G. Sheldon, a series of *Colias hecla*, from the Porsanger Fjord, Arctic Norway, with specimens of the other orange species occurring in Europe for comparison.—Mr. W. J. Lucas, a living male of *Labidura riparia* (the Giant Earwig), taken on the shore near Christchurch, Hants. He also exhibited a drawing giving the colour of the living insects, and demonstrating how well they are protected by resemblance to the pale sand of the Hampshire coast.—Mr. G. T. Bethune-Baker, specimens of *Heptalus pyrenæus*, a species found not uncommonly on the higher parts of Mount Canigou, with the apterous female. Also a fine form of *Lycæna arion*, and a specimen of *Heodes hippothoe* that was at once radiated, obsolescent, and asymmetrical.—Mr. Douglas Pearson, a drawer of Rhopalocera from the Black Forest and the Swiss Alps, including an albinistic specimen of *Erebia lappona*, an unusually large female of *Melitæa varia*, the large Black Forest form of *Colias palæno*, *Brenthis pales* from Pontresina, with under side hind wings of a deep purple-red, and others.—Mr. J. A. Simes read the following note:—

"On the 15th July, 1912, I came across *Erebia glacialis* in some numbers on a scree slope below the summit of the Colette de Gily, Dauphiny, and saw a female alight on a piece of loose rock on the slope, sun itself for a time and then proceed to walk slowly backwards until it reached the lower end of the rock. It then bent its abdomen underneath the slab of rock and deposited an egg on the lower surface of it. I subsequently observed a second female behave in precisely the same manner, and eventually deposit an egg on the under side of a detached slab of rock on the scree slope."—The President exhibited a species of *Osmia* and its cell, found three and a half years ago, beside a little stream at Jericho, and which only emerged during the Oxford Congress this year.—Mr. H. Baker Sly, a very dark example of *Brenthis selene*, having the under wings clouded with dark brown all over, except for a slightly lighter shaded spot in the middle, and the upper wings very heavily clouded with dark brown; it was taken in Worth Forest, Sussex, May 26th, 1912. He also showed a specimen of *Epinephele ianira*, one upper wing having a white blotch at the tip, and also the under wing on the same side with a white streak, taken at Box Hill, August 11th, 1912. The following papers were read:—"Life-history of *Lonchæa chorea*," by A. E. Cameron, M.A., B.Sc.; communicated by H. S. Leigh, F.E.S. "A Few Observations on Mimicry," by W. J. Kaye, F.E.S.—GEORGE WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 11th*.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Dennis exhibited galls from the poplar-tree made by two species of Aphis, *Pemphigus bursarius* and *P. spirotheca*, the former of a pyriform shape on the petiole, and the latter of a spiral shape, also on the petiole.—Miss Fountaine, a fine set of examples, mostly bred by herself, of species of *Callidryas* from the West Indies and South Africa, with the large species of *Gonepteryx* from America.—Mr. Main, living larvæ of *Pyrameis cardui* from Eastbourne, and a fine series of *Pieris napi* and var. *bryoniæ*, the results of recent experiments.—Mr. J. Platt Barrett, a bred specimen of *Charaxes jasius* from Sicily, and made remarks on the spring and early summer of the present year in that island.—Mr. Step, photographs of the leaves of the maple and sycamore, with the cases of the sawfly larva, *Phyllotoma aceris*, and remarked on the occurrence of the species at Ashted and Oxshott. Several other members had also met with the species.—Mr. Adkin, the cocoon of *Platysamia cecropia*, previously shown by Mr. Dods, and pointed out that the inner envelope of the cocoon was reversed, hence the imago had to emerge from the wrong end of the outer envelope. He also showed several bred series of *Coremia ferrugata*, and read notes on the variation.—Mr. H. Moore, a variety of *Papilio phorcas* from Africa, in which the veins were margined with white on the green areas of both wings.—Mr. Sich, the pupa-cases of *Libythea celtis*, showing that the pupa lies in a horizontal position under a leaf without a girdle, and also white egg-shells of *Cerura vinula* found in Sussex.—Mr. Edwards, two large species of Eastern Satyridæ, *Neorina hilda* and *N. crishna*.

July 25th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—

Mr. West (Ashted) exhibited ova of a *Chrysopa* on the leaves of the garden ox-eye daisy. — Mr. Edwards, the butterflies *Eunica eurota* from Brazil, *Smyrna blomfeldii* from Mexico, and *S. karwinski* from Brazil. — Mr. J. Platt Barrett, a full-fed larva of *Saturnia pyri*, from Sicily, young larvæ of *Colias edusa* from ova of an English caught female, and a large number of butterflies from South Africa. — Mr. R. Adkin, *Ptycholoma lecheana* from Brentwood, one almost unicolorous buff colour and unusually pale, the other a rich deep brown with very distinct silvery markings. — Remarks were made on the abundance of *Celastrina argiolus*, and the occurrence of *Sesia stellatarum* and *Colias edusa* this season.

August 8th. — The President in the chair. — Mr. Ashby exhibited larvæ and imago of the local coleopteron, *Cassida fastuosa*, from Otford. — Capt. Cardew, larvæ of *Papilio machaon* from Stalham Dyke spun up for pupation. — Mr. Hugh Main, larvæ of *Papilio alexanor* from the South of France. — Mr. H. Moore, a short series of *Colias edusa* taken in the Forest of Arques, Dieppe, in August. — Mr. Priske, a female cockroach, *Periplaneta orientalis*, with the ootheca still attached to her. — Mr. F. D. Cooke, the pupæ of *Pyrameis cardui* to show the difference between those spun up on white muslin and those on darker material. — Mr. Newman, long series of *Dianthæcia carpophaga*, specimens of *D. capsicola* and *D. capsophila*, and Kentish *Dianthæcia* identical with Isle of Man *D. capsophila*. — Mr. Blenkarn, *Haliphus wehncke* with aberrant œdeagus, a specimen of *Clytus arietis* with the first yellow belt reduced to a minute spot, an unusually small example of *Philonthus puella*, and specimens of the very rare coleopteron, *Pentarthrum huttoni*, from the cellars of Messrs. Møet & Chandon.

August 22nd. — Mr. B. H. Smith, Vice-President, in the chair. — Mr. Edwards exhibited the exotic butterflies — *Thaumantis diorea* from Assam, *Discophora lepidu* from Ceylon, *Tenaris selen* from the Malay, and *T. honrathii* from Madagascar, all belonging to the Asiatic section of the Morphinae; and specimens of *Opsiphanes boisduvalii* from Mexico, referring to the conspicuous tuft of scent-hairs. — Mr. Newman, a very long series of *Pachnobia hyperborea* from Rannoch, showing much variation; a short, very uniform series from Shetland, where the species was fast disappearing from the attacks of ichneumons; a few *Crymodes exilis* from Shetland, including a very pale specimen; and a long series of his inbred yellow form of *Callimorpha dominula*, with the only intermediate he had obtained. — Mr. Sheldon gave a very interesting account of his holiday near the North Cape in search of butterflies and birds' eggs. — Mr. Sich, specimens of *Coleophora apicella*, taken at Byfleet in June, where its food-plant, *Stellaria graminea*, grows abundantly. — Mr. Adkin, *Chrysopa* ova, which were on unusually short stalks. — Reports were made that larvæ were very scarce this season, especially in the New Forest. *Bryophila perla* was noted as very scarce. *Agriades coridon* was still common in Hertfordshire, and several var. *semi-syngrapha* had been taken, while the females varied from very deep black to khaki-coloured ground. Capt. Cardew noted the curious fact that *B. muralis* was common at Folkestone, but com-

pletely absent from Dover, where apparently conditions were most favourable.

September 12th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Tonge exhibited an *Ephestia* sp. bred from an Egyptian date.—Mr. Moore, galls found on the wild rose.—Mr. Gibbs, a *Rumicia phleas* from Woburn, a combination of ab. *radiata* and ab. *cæruleopunctata*.—Capt. Cardew, an *Apatura iris* with much fulvous shading on the fore wings and apex of hind wings; a series of *Eupithecia subfulvata*, bred, from Northumberland; and living larvæ of *Acidalia immutata*.—Mr. Curwen, a large summer form of *Pieris napi* with rays evanescent, *Polyommatus icarus* ab. *semi-arcuata*, *Agriades coridon* with aberrant markings on the under sides, and an *Argynnis niobe* var. *eris* with an extremely deep green ground on the under sides of the hind wings.—Dr. T. A. Chapman, specimens of *Agriades alexius* and of *Polyommatus ictus* ab. *icarinus*, and gave a detailed account of the former species, which Freyer put forward in 1858.—Mr. Tonge reported *Leucania albipuncta* at sugar at Deal, and specimens of *Polia chi* at Winslow, in Bucks.—Mr. Sich read his report as delegate to the International Congress of Entomology at Oxford in early August.

September 26th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Dr. Chapman exhibited varieties of "blues" taken in the French Alps this year, where several species were of unusually large size; they included *Polyommatus icarus* resembling *P. escheri*, *Agriades thetis* ab. *punctifera*, a possible hybrid between *P. damon* and *A. coridon*, &c.—Mr. Colthrup, long series of *Pachygasteria trifolii* from Romney and Eastbourne, the former showing much variation, especially in the males; specimens of *Satyrus semele* with the eye-spot in the anal angle of the hind wings absent; an unusually large example of *Colias edusa* var. *helice*, &c.—Mr. Newman, a long bred series of *Papilio machaon*, of fine size mostly, but only showing trivial variation in size and position of the discoidal spots, in amount of blue in the hind wings, in the breadth and depth of colour of the transverse bands, &c.—Mr. Hugh Main, a beetle, *Caryoborus nucleorum*, bred by him from the Coquilla nut previously exhibited with the larva in by Mr. Joy.—Mr. J. P. Barrett, the larvæ of *Cebrio gigus* (?), a coleopteron occurring somewhat freely in his son's garden in Messina, doing injury to his potatoes; a short series of *Lyceena arion* from Cornwall, *Algeria muscaformis* and *Diantharia luteago* var. *ficklini* from the same county, and a huge earthen cocoon of *Manduca atropos*.—Mr. Tonge, a fragment of slate from Cornwall containing a fossil in appearance very much resembling an orthopteron.—Mr. Curwen, a very varied series of *Brenthis pales* from Switzerland.—Mr. Blenkarn, the rare coleopteron, *Henoticus serratus*, taken in the offices of Messrs. Möet & Chandon's, Northumberland Avenue; and a series of bred *Porthesia chrysorrhæa* from Sandown, including two with bright golden tufts instead of the usual rich brown.—Mr. Lucas, a living female of the rare orthopteron, *Metrioptera roeselii*.—Mr. Turner, for Rev. C. R. N. Burrows, a beautiful series of *Celasirina argiolus*, bred from larvæ taken on

Portugal laurel, notable for their large size and brilliant coloration, approaching the American form *psculargiolus*.

October 10th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Lucas exhibited specimens and detailed drawings of the species of British earwigs to illustrate his paper, with living examples of the very local *Labidura riparia* from Christchurch.—Mr. Tonge, a very dark-marked example of *Acidalia ornata* from Reigate.—Mr. Sheldon, a long series of *Colias hecla* from North Lapland, with examples of other European *Colias* species for comparison.—Mr. Adkin, specimens of *Nola albulalis* bred from larvæ that had hybernated in confinement.—Mr. Newman, a long series of *Agriades coridon*, including several ab. *semisyngrapha*, from Royston, and showing in the females much variation in the ground colour of both upper and under surfaces; and third generation specimens of *Ennomos quercinaria*, all with the apex of the fore wings dark—twenty-five per cent. of the second generation had been melanic, of a dark chocolate colour.—Mr. Lucas read a paper on "Earwigs that Breed in Britain," and illustrated his notes with a large number of lantern-slides.—HY. J. TURNER (*Hon. Rep. Sec.*).

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, October 21st, 1912.—Mr. Wm. Webster, Vice-President, in the chair.—This being the opening meeting of the session was devoted to exhibits of the past season's work.—Mr. F. N. Pierce showed a box of Lepidoptera from Silverdale, Lancashire, which included *Nemeobius lucina*, *Argynnis euphrosyne*, and *Euclidia mi*; from Tansor, Huntingdonshire, *Schrenobius mucronellus*, *S. forcicellus*, *Acentropus niveus*, *Hydrocampa nymphaea*, *H. stagnata*, and *Paraponyx stratiotata*; also *Scopula ferrugalis* from Oxfordshire.—Mr. L. West exhibited his recently published work 'The Natural Trout Fly and its Imitations,' containing a fine series of coloured illustrations of the flies used by the angler for trout, together with a set of the artificial flies inserted on special pages.—Mr. B. H. Crabtree, two drawers containing his very fine series of variations of *Abraxas grossulariata*, including vars. *nigra*, *nigro-sparsata*, *nigro-cerulea*, *flavo-fasciata*, *hazeleighensis*, *lutea*, *varleyata*, and other striking forms.—Mr. R. Tait, Jun., a long bred series of *Agrotis ashworthii*, with vars. *substriata* and *virgata*; very fine set of *A. agathina*, including var. *rosea* and a melanic form of *Boarmia repandata* from North Wales; *Leucophasia sinapis*, *Colias edusa*, *Ligdia adustata*, *Bapta temerata*, and *Melanippe galiata*, from South Devon; *Tephrosia luridata*, from Wyre Forest; and *Nyssia zonaria*, from Conway.—Mr. W. A. Tyerman, the following species from Ainsdale, viz.:—*Procris statites*, *Neuria reticulata*, *Dianthecia nana*, *Plusia festucae*, *Phibalapteryx lignata*, and *Eupithecia satyrata* var. *callunaria*.—Mr. W. Mansbridge, Micro-Lepidoptera collected in Lancashire and Cheshire during the past season, viz., a long bred series of *Tortrix costana* and melanic and intermediate variations; a long bred series of *Phycis fusca*; series of *Micropteryx unimaculella*, *Coleophora fuscadinella*, and *C. lutipennella*, *Ornix betulae*, *Lithocolletis quercifoliella*, and *L. cramerella*, from Delamere; *Pancalia leuwenhæckella* and *Pyrausta purpuralis*,

from Grange, the last being very brightly coloured.—Mr. Prince, a bred series of *Cidaria reticulata*, from Windermere; *Nemeophila plantaginis* var. *hospita*, from the Lake District; and many coast species.—WM. MANSBRIDGE, *Hon. Sec.*

RECENT LITERATURE.

1. *Annals of Tropical Medicine and Parasitology*. Vol. vi. No. 1, B (May 29th, 1912); No. 2 (July 31st, 1912); No. 3, A (September 12th, 1912). Liverpool. In addition to papers concerning insects in their relation to disease, such as malaria and sleeping-sickness, there are :—(1) "A new Tsetse-fly from British East Africa (*Glossina austeni*) by Prof. R. Newstead, F.R.S., in No. 1; and (2) Three important papers in No. 2 by H. B. Fantham, D.Sc., and Annie Porter, D.Sc., on the "Isle of Wight Disease of Bees."

2. *Memorias do Instituto Oswaldo Cruz* (Ano 1911, Tomo iii. Faciculo ii). Rio de Janeiro, 1911.—Pages 295–300 are concerned with certain Culicidæ.

3. *Two Insect Pests of the United Provinces*—the Sugar-cane Grasshopper (*Hieroglyphus fuscifer*) and the Potato Moth (*Plutella maculipennis*)—by T. Bainbrigge Fletcher, R.N. ('Agricultural Journal of India,' vol. vi. pt. ii). Calcutta, 1911.

4. *Dragonflies of the Cumberland Valley in Kentucky and Tennessee*, by C. B. Wilson (Proc. U. S. Nat. Mus. vol. 43, pp. 189–200). Washington, 1912.

5. *The Proportion of the Sexes in Forficula auricularia*, by H. H. Brindley, M.A. (Proc. Camb. Phil. Soc. vol. xvi. pt. 8). Cambridge, 1912. A short but important paper, which must have entailed a large amount of work in its preparation.

6. "*Microscopes for Entomologists*."—We have received a copy of the new edition of E. Leitz' Catalogue of Microscopes, and a pamphlet concerning a new eyepiece for demonstration purposes. Some of the new forms of microscope are specially suitable for entomologists, and anyone intending to purchase an instrument would do well to call at 18, Bloomsbury Square, W.C., and inspect them.

W. J. LUCAS.

The Humble-Bee, its Life-History, and how to Domesticate it. By F. W. L. SLADEN, F.E.S. Illustrated with Photographs and Drawings by the Author, and Five Coloured Plates Photographed direct from Nature. Pp. i–xiii, 1–283. London: Macmillan & Co., Limited. 1912.

PROBABLY few insects of the open country are more familiar to field entomologists than Humble-Bees, and yet, speaking generally, how limited is our knowledge of these very interesting members of the Hymenoptera-Aculeata! Except, of course, to those who specially study Bombi, the separation, for example, of the workers of *B. lucorum* from the workers of *B. terrestris* would not always be an

easy task, even when the respective queens of these species could be distinguished with some certainty.

The beautiful and very lifelike figures, together with the descriptions, comparisons, &c., furnished by Mr. Sladen in the book under notice, should certainly remove most of, if not all, the difficulty connected with the satisfactory identification of our humble-bees and usurper-bus. Apart, however, from its utility as an aid to identification, the book is a veritable storehouse of information concerning life-history, habits, parasites, enemies, and many other matters of great interest to the student of *Bombi*.

The seventeen species of *Bombus* recognized by Mr. Sladen as British are here divided into two main groups: Pollen-storers (eight species), and Pocket-makers (nine species), the latter being again subdivided into Pollen-primers (four species), and Carder Bees (five species). Two species—*B. soroënsis* and *B. cullumanus*—have only been associated with the pollen-storers because they possess structural affinities with members of that group, the author so far having been unable to study their nests. Six species of the genus *Psithyrus* are described and also figured on the plates.

Transactions of the Carlisle Natural History Society. Vol. ii.
Pp. 1-256. 1912.

AMONG other papers of interest to naturalists in this excellent publication are two which will chiefly appeal to entomologists. These are: "The Lepidoptera of Cumberland, Part ii. (Moths)," by George R. Routledge, F.E.S. (pp. 94-183), and "The Coleoptera of Cumberland, Part ii.," by Frank H. Day, F.E.S. (pp. 201-256). In the instalment of Mr. Routledge's list over two hundred and thirty species, belonging to the families Sphingidæ to Noctuidæ, are entered as found in the county. Mr. Day, dealing only with Haliplidæ, Dytiscidæ, Hydrophilidæ, and Staphylinidæ, records six hundred and seventy species for Cumberland.

Localities are given in each list, and in that of the Lepidoptera there are references to literature and remarks on variation, &c.

OBITUARY.

WILLIAM FORSELL KIRBY, F.L.S., F.E.S.

FOR a second time this year the 'Entomologist' appears in mourning, for we have to deplore the loss of yet another of the willing workers who have so materially assisted us on the Reference Committee of our magazine, William Forsell Kirby. Mr. Kirby, indeed, in retirement as in active harness, proved himself to be one of the most accurate, original, and painstaking of naturalists. Nor was the field of his activities circumscribed within one particular Order; while, independently of entomological work, he made name

and fame as linguist, and poet in the realms of folk-song, and fairy-land. The sagas of the North and the tales of the Orient particularly exercised a fascination over a mind none the less imaginative because, tutored in the schools of science, it had achieved the virtue of orderliness. I regret to say that it was only in his later life that I came in close touch with him, and learned to appreciate his exquisite and fantastic humour, his literary sense, and profound scholarship. Away, indeed, from his Department in the Natural History Museum, South Kensington, where he did faithful service from 1879 and 1909, after twelve years' apprenticeship in the Museum of the Royal Dublin Society, he allowed himself to pass from the dusty road of reality to the by-paths of romance with all the enthusiasm and freshness of a heart which never grew old. He even broke a lance or two in the arena of controversial theology, his views as a naturalist in relation to the organization of the cosmos finding expression in a book on 'Evolution and Natural Theology.' But it is not within our province here to appraise his literary labours outside the sphere which he continued to enrich and adorn to the last days of a useful life; though I recall now that it is barely a year since he wrote to me in connection with a projected entomological text-book which he had been offered: "I have other work in hand, and can hardly spare the time; besides which, I have rather written myself out in that direction." This, however, was no more than a characteristic assertion of the innate modesty of the man whose pioneer endeavours opened up to so many otherwise "British" entomologists new and delightful regions to explore. His 'Manual of European Butterflies' appeared in 1862, and was, I believe, the first guide to the subject by an English author published in England, and this he supplemented in 1863 with 'A Synonymic List of European Butterflies for Labelling Cabinets,' which, again, was followed eight years later by the 'Synonymic Catalogue of Diurnal Lepidoptera' (Supplement, 1877)—still a standard and much consulted authority. Meanwhile, a number of papers from his pen on all Orders were being contributed to the 'Transactions' of the Entomological Society of London, and the Journals and Reports of other scientific Societies; and past issues of the 'Zoological Record' bear further testimony to his unflagging industry as a compiler. He was elected a member of the Entomological Society in 1861, and served as one of the Hon. Secretaries from 1881 to 1885, and as member of the Council in 1886. He joined the staff of the 'Entomologist' in 1894.

The son of Mr. Samuel Kirby, banker, of Leicester, he was born in 1844, and married, in 1866, Johanna Maria Kappel, who predeceased him in 1893, leaving one son. William Forsell Kirby himself died on Wednesday, November 20th last, and was buried in Chiswick Cemetery on November 26th.

H. ROWLAND-BROWN.

IMPERIAL AGRICULTURAL RESEARCH
INSTITUTE LIBRARY
NEW DELHI.

[illegible]